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JULY 1988
VOLUME 6
NUMBER 7

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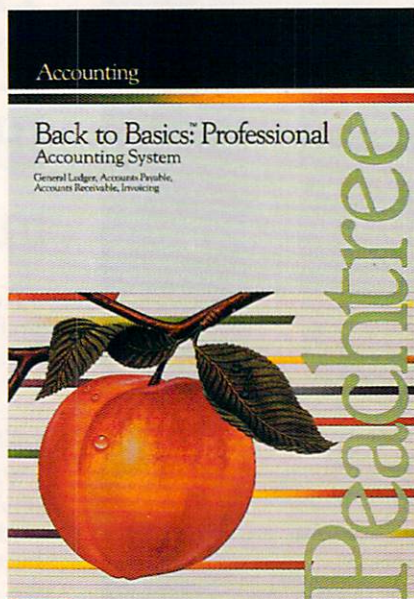
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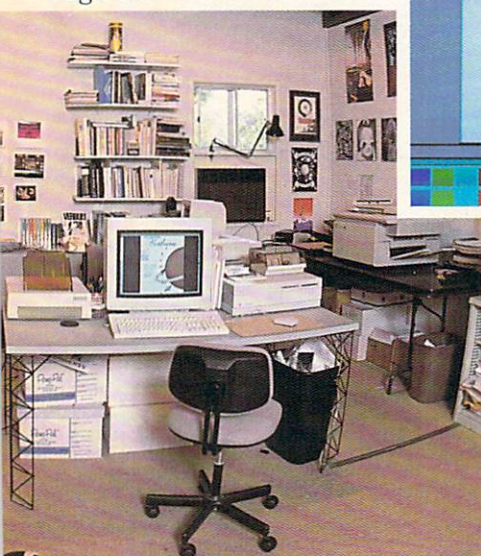
How MECA's *Managing Your Money* helps one busy real-estate investor manage his properties—and save time and money.

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Customize your telephone system by adding voice mail that will deliver targeted messages, leave communications in private mailboxes, and initiate calls.

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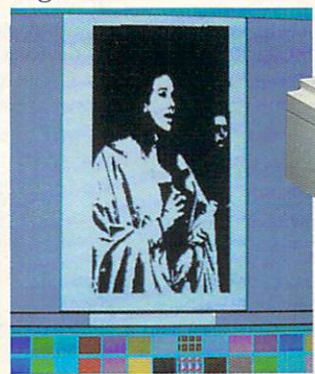
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46 MAKING MONEY MAKING MUSIC

Notable advice from four professional musicians who outfitted their home studios with computers, synthesizers, and other recording equipment and 'tuned' in to profitable businesses. PLUS: INTRODUCTION TO MIDI

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The AT&T Cordless Telephone 5310; Boca's Multi-EGA board; Code-A-Phone's Model 5530 Answering Machine; Hewlett-Packard LaserJet Series II; MSC Technologies's A+ Mouse; Magnavox Professional Multimode display monitor; and Mitac Paragon 286 Computer.

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Reviews of 24 programs for business & productivity, education & creativity, and entertainment.

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In the market for a new job or a career change? Consult *Career Navigator* for help identifying your strengths, weaknesses, and interests and preparing for interviews.

24 ENTERTAINMENT HINTS, NEWS, AND NEW GAME FORMATS

This month, designer Brian Fargo provides hints for *The Bard's Tale III: Thief of Fate* and tells about his latest creation, *Neuromancer*. Also, hints for *Deathlord* and *Silent Service*. PLUS: CONVERSIONS TO NEW MACHINES

67 THE PROGRAMMER

This month's programs: *Mailing Labels* (Productivity) and *Grand Old Flag* (Microtones).

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FAMILY & HOME-OFFICE COMPUTING (ISSN 0738-6079) is published monthly by Scholastic Inc., 730 Broadway, New York, NY 10003. Subscriptions: in U.S., 12 issues for \$19.97; Canadian and U.S. possessions add \$6.00 per year for postage; foreign residents add \$8.00 per year. Printed in U.S.A. Copyright © 1988 by Scholastic Inc. All rights reserved.

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EDITOR'S NOTE

WHATEVER HAPPENED TO THE LONE COWBOY?

When we started publishing in 1983, our editors would find one inspirational example of someone using a computer in an especially creative or productive way, and, a while later, they would find another. One by one. That's the way it went, pioneer after pioneer, oddity after oddity, always with a short time between. And when we told these stories, they met with a fair amount of head shaking and awe and a dash of skepticism, with almost no one identifying with the subjects.

Today, the availability of powerful computers at reasonable prices and of versatile software capable of performing tasks we had not previously imagined has changed the landscape. Now our editors have no trouble finding stories that provide real-life examples of successful computer owners engaged in a range of endeavors. Our readers have before them a variety of models, any one of which they might decide to follow.

This issue reminds me of just how far we've come. For example, researching our cover story on running a desktop-publishing business ("How to Start and Run a Desktop-Publishing Business," page 29) unearthed countless entrepreneurs engaged in different sized businesses producing varying categories of work. It wasn't that long ago that we all first heard the term *desktop publishing*, and now few people would be surprised to meet someone who makes a living at it—from home.

Another major change reported here involves musicians (See "Making Money Making Music," page 46), whom in the past I never pictured working out of their homes. Now, thanks to computers and related



technologies, music for major television programs, records, and various projects is being created in home-based recording studios. Again, we uncovered a number of professionals working this way.

For the most part, the image of the lone cowboy, the isolated creative genius (often regarded as a "nut"), burying himself in a computer, has faded. Today, there are legions of enterprising innovators creating and offering outstanding products or services in any given field, on their own terms, often in their own homes. Millions more dream of joining their ranks. These are men and women who are or long to be independent, who value family and friends and want to work near them, and who are stretching traditional boundaries of working and living with the help of new and powerful technologies.

Claudia Cohl

CLAUDIA COHL
EDITOR-IN-CHIEF

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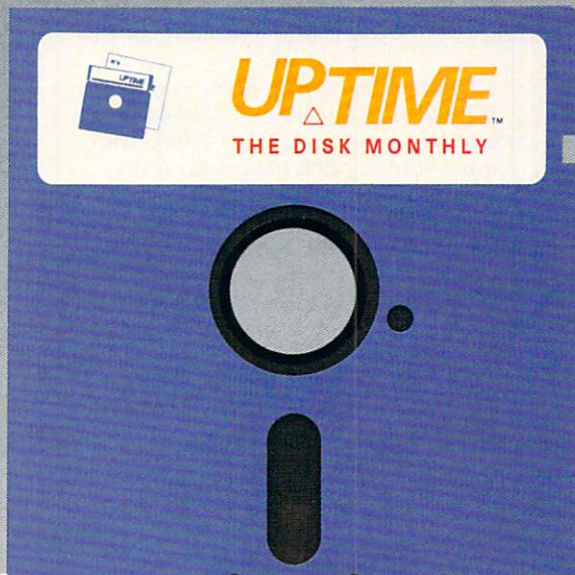
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LETTERS

GURU PUBLICATION ERROR

While reading "Be Your Own Tax Guru," in the March issue, I discovered an error regarding *Sylvia Porter's SwiftTax*.

Under the "price for yearly update," one is led to believe that once you purchase the original package, you can purchase the update each year. Not so—you can buy the update the next year; then you have to purchase the whole package again. I do not know if this is true with all programs, but I do know about *SwiftTax*.

HORACE H. HUNTER, JR.
Blanchard, Oklahoma

JARGON-FREE JOURNALISM

As a new subscriber to your magazine and owner of a new IBM XT, I find your articles to be relevant, topical, and void of the often unnecessary technical jargon found in other computer periodicals.

I found Steve Morgenstern's "A Guide to Fiscal Fitness" in the January issue particularly interesting.

MICHAEL P. ZURIK
Fresh Meadows, New York

PLEA FOR STANDARDIZATION

This is an open letter to all software manufacturers. Please explain why no two packages of software have similar ways of operation. In my view, many programs could use F1 or another common key to call up a menu and use standard keys for editing, undo, exiting, and other common functions.

Of course, IBM, Mac, and Apple software would differ, but how much better it would be if the software for these three standards were more standard! Users could reduce a lot of the learning time needed for each new software purchase.

ROSLYN STRAUSBERG
Bronx, New York

GOOD WORK!

I have just subscribed to your magazine and recently received my first issue, though I've been reading it since the computer bug bit me last fall. This has got to be the most informative and realistic computer magazine published today. The writers of the articles "talk" to us readers as human beings, instead of computers! I really appreciate reading a paragraph and actually under-

standing what it says!

I also appreciate that you've aimed your magazine at individuals, and not at corporations. I find the business articles, such as May's "20 Building Blocks for a Successful Home Business" chock-full of good advice, especially since I plan on starting one this summer.

LINDA KELLEY
Glen Allen, Virginia

PROS AND CONS

I recently purchased the April issue of *FAMILY & HOME-OFFICE COMPUTING*. I am pleased to find that your magazine provides information on the home office.

How can I get copies of articles you've already published on this subject?

ARLENE LLYOD
Hyattsville, Maryland

EDITOR'S NOTE: *We've been regularly publishing features on home-office operation since October 1985. You may obtain back issues by writing: Back Issues, FAMILY & HOME-OFFICE COMPUTING, P.O. Box 717, Cooper Station, New York, NY 10276-0717.*

Include \$4.25 for one to four copies; \$3.50 each for five to 10; and \$3 each for \$10 or more. Specify desired issues by month and year.

CORRECTIONS

The correct telephone number for Communifax, a property-tax reduction service franchise listed in "Home-Based Franchises" on page 48 of the May issue, is (214) 991-9222; its toll-free number is (800) 634-5176. The company has recently moved to 5080 Spectrum Drive, Suite 1002, West Lock Box 57, Dallas, TX 75248.

A reader corrected our spelling of Hollins College in Roanoke, Virginia ("Do Computer Skills Make College Grads More Marketable?" April, page 26). We apologize for the error.

FAMILY & HOME-OFFICE COMPUTING looks forward to letters from all its readers. Please direct your correspondence to Letters to the Editor, FAMILY & HOME-OFFICE COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, and phone number. We reserve the right to edit letters for length and clarity.

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STEVE LEVIN, COMMODORE MICROCOMPUTERS



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HOME-OFFICE SHOPTALK

AN EXPERT'S ADVICE ON STARTING, RUNNING, AND EXPANDING A HOME-BASED BUSINESS



**BY
JOANNE
H. PRATT**

Stuck trying to think of a new business idea? Think of *what* you already know and *whom* you know. The best ideas are often extensions of what you have learned to do while working for someone else, pursuing a hobby, or managing a household. To get your first clients and customers, target the people you already know. You give them your business—don't be shy in asking for theirs!

Q. I am looking for a dot-matrix printer for my home office that costs less than \$600. The problem is that I expect my printer to be able to print envelopes. A normal request, I would

think. The Epson, NEC, Toshiba, and Okidata models I tried (each with 18 or 24 pins) all smudged the envelope or otherwise printed badly. Although the 9-pin IBM Proprinter did a fine job on the envelope, the print was not letter-quality. Do you know a dot-matrix printer that will fit the bill?

GEORGE BRAYTON
Austin, Texas

A. I share your observation that one's letters carry their own "messages." Dot-matrix printouts shout "cheap mass mailings"; they don't impress your customers and clients with your authority or give them confidence in the reliability of your business.

You don't say which printer models you tested; did they have a "copy control" knob? Virtually all new printers have this device, which allows you to adjust for different weights of paper. When printing an envelope, which is thicker than let-

terhead paper, you should open the knob all the way.

The NEC Pinwriter P 2200 (a 24-pin printer), which lists for \$499 but is advertised for less than \$400, has this feature. It even has a front-feed slot into which you feed envelopes or single sheets of paper. Investigate several printers to see if you like the output. Try printing the envelopes in boldface for a sharper look.

If that's *still* not good enough, the practical answer may be to buy a typewriter for printing envelopes.

Q. I am the proud owner of an old IBM PC-1, and I desperately need to update my machine to handle a hard drive so I can run my home-based bookkeeping service more efficiently. I'm told I need a new ROM BIOS kit, and I have exhausted all avenues that I am aware of in search of this product.

SHIRELENE R. MALLON
Portland, Oregon

When it comes
to personal copiers,
our competition
really taught us
a lesson.

A. If you persist, you can still find the ROM BIOS kit by calling around the country. Try a ComputerLand store near you, which has a national network it can query for hard-to-find parts. If one source doesn't have the kit, you can ask for suggestions on where to try next. As it happens, the ComputerLand I called in Dallas had the part you're seeking.

An alternative to upgrading the ROM BIOS is to boot your new hard disk from your floppy disk with software such as *Fboot*, from Lifetime Memory Products (12611 Research Blvd., #400, Austin, TX 78759; [800] 622-8001). You may also have to upgrade your power supply.

Q. It has come to my attention that there are business opportunities in the area of software rental. What are the legal ramifications of such an undertaking?

FRANCES E. TERRELL
Cleburne, Texas

A. Dealing with legal ramifications is the crux of operating a software rental business. Read the fine print on the *before you open this package* legal agreement that is usually enclosed with new software. The manufacturer's position is that your dollars don't buy software; they simply

give you limited rights to use it. MicroPro, for example, claims to retain "exclusive ownership" of *WordStar*. What you buy is the nontransferable right to use the software on a single computer.

Firms that rent software defend the legality of their business saying that they have purchased the right to use the software—and that the right is open-ended. Their position is that they are not obligated to accept the manufacturers' license agreements.

Joe Griffis, of Garland, Texas, who owns three-year old Softies, a software-rental business, cautions that renting software is not a typical business. You will need a thorough market survey, lawyers to respond to manufacturers' complaints, and detailed contracts with big deposits so that your customers return the software and don't copy it. Softies is almost ready to franchise its software-rental know-how.

Q. I am interested in starting a computerized bookkeeping, accounting, and payroll service. Are there any books I can buy or people I can contact about starting this type of business?

MRS. GAMBLE MITCHELL MILLER
Bronx, New York

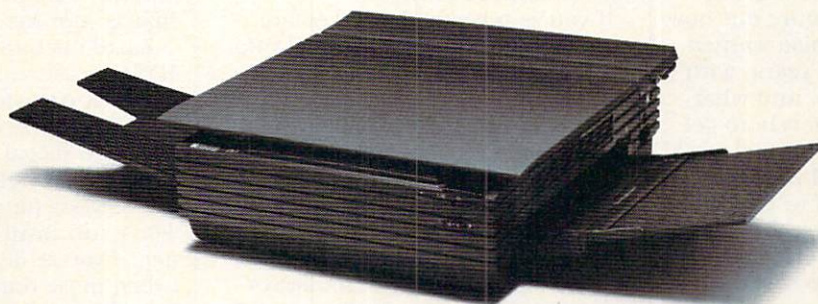
A. The Bank of America's 20-page pamphlet—*Establishing an Accounting Practice*—may give you some tips (Bank of America, Dept. 3631, P.O. Box 37000, San Francisco, CA 94137; \$5 postpaid).

You can also look to SCORE (Service Corps Of Retired Executives) for excellent free advice. You will find a telephone listing for SCORE under the Small Business Administration office nearest you. SCORE counsels entrepreneurs on starting and managing their businesses.

Also, check with community colleges for workshops on starting and managing a small business. You will receive help on developing sales, managing cash flow, and keeping records. ■

SEND US YOUR HOME-OFFICE QUESTIONS

Send your questions on home business, moonlighting, telecommuting, or any other income-producing work to consultant Joanne H. Pratt, c/o Home-Office ShopTalk, FAMILY & HOME-OFFICE COMPUTING, 730 Broadway, New York, NY 10003. Due to the volume of mail received, not all questions can be answered. Ms. Pratt regrets that she cannot give personal replies except through her consulting firm, Joanne H. Pratt Associates, P.O. Box 190647, Dallas, TX 75219.



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FINANCE

A DONALD TRUMP IN THE MAKING? How *Managing Your Money* Helps One Budding Real-Estate Tycoon Manage His Properties

BY KATHRYN BONN

With some help from a famous investment expert and an IBM PC AT, Greg Zazula has turned himself into a successful real-estate investor. To save time and money, the 31-year-old landlord regularly uses MECA's *Managing Your Money* (MYM), authored by financial whiz Andrew Tobias, a top-selling program for personal and small-business finances.

Zazula, who manages his real-estate business from his Brookline, Massachusetts, home, owns several properties in the Boston area. He took the plunge into the real-estate market five years ago when he invested in a three-family home, a six-family home, and a parking lot.

PRE-MYM DAYS

For the first year, he calculated everything by hand. But the paper method was highly inefficient.

"I knew there had to be a better way," he recalls. "I wanted to find out where things stood every month—like what oil was costing per day—to be able to figure out how much rent to charge. I also wanted to track things over the years, with graphs of what went up, and what went down. And my goal was to get the best computerized tools to do this."

Zazula bought an IBM PC AT, Lotus 1-2-3, and dBase III+. Unfortunately, these sophisticated business packages weren't right for him. "I found myself spending too much time trying to understand the programs."

Three years ago, Zazula discovered *Managing Your Money*, and in many ways, it's been the answer to his business-related prayers. Between the warm and friendly Help screens and manual, he was comfortable with the program from day one. "The way the Help screens are written is great—they're written in English," says Zazula. "There's comedy, and it's enlightening—very user-friendly. I don't want anyone to assume I know anything, but as an advanced user, I'm not bored."

MYM FITS LIKE A GLOVE

Zazula has found that MYM fits



The Financial Calculator section of MYM can help users determine whether a piece of real estate is a smart investment.

his requirements perfectly. "I look at it as a real-estate program," he says. He's made good use of most of MYM's chapters. One heading in the manual, Professional Applications, includes a subhead titled "If You Are a Landlord." (Other sections are directed to such professionals as farmers, bankers, accountants, and small-business owners.)

If you've invested in real estate, you can plug in such financial information as accounts payable/receivable, depreciation, and property-tax rates, and the program helps determine whether or not it's wise to buy new property. Zazula claims that he's made important business decisions with confidence using MYM. "Being able to assess my net worth is good for me because I'm always looking to buy more real estate. It's like calling up Andrew Tobias and asking, 'What do you think?'"

For instance, when Zazula was recently considering buying another six-family home, he relied on MYM for help in evaluating the investment. Taking the new tax laws into account, Zazula plugged in his data and ultimately decided the \$750,000 price tag for the property was too high. "It looked good until I ran the numbers through the computer," he says. "Then I realized that I was better off with my money in the bank."

Tax time is when Zazula gets the most out of MYM. The time and effort needed to straighten out masses of papers and figures can be greatly reduced by such a program as MYM. Zazula spends far less time with his

accountant since he started using the program.

Zazula praises MYM's publisher, MECA, for keeping MYM users well-informed about the ever-changing tax laws. Subscribers to MECA's Plus Plan receive yearly updates, which incorporate new tax information and new program features, and quarterly newsletters, written by Andrew Tobias, which contain valuable tax tips and investment ideas.

Indeed, he has taken advantage of many, if not all, of MYM's capabilities. One feature, for instance, reminds him when his mortgage payments are due, and on the flip side, alerts him when his tenants' rent checks are late. Paying bills is easier with automatic check writing, and important phone numbers are on tap in the card file. And with the built-in word processor, sending out a memo informing eight of his tenants of the bad news that their water has to be turned off for plumbing repairs is no problem—for Zazula, that is, not his tenants.

Zazula is bothered by one of MYM's features: the copy-protection flag that occasionally asks the master disk to check that the user isn't using an illegal copy. If you can't supply the original disk, you're out of business for a while—the program won't run until you insert the original. If you're dividing your time between more than one office, as Zazula does, you may not have the original with you. Moreover, even though he finds the program well suited to his needs, Zazula would like MECA to create a *Managing Your Real Estate* or *Managing Your Small Business*.

MYM has obviously been a substantial boon to Zazula's business. "I've gotten a better return on my original investment," he says. "I've been able to work better and maximize profits. MYM has saved me a lot of money." And that, as they say, is the bottom line. ■

MYM INFORMATION

Managing Your Money by Andrew Tobias. Available for IBM PC and compatibles and 512K Macintosh. \$220. Published by MECA Ventures, Inc., 355 Riverside Ave., Westport, CT 06880; (203) 226-2400.

KATHRYN BONN wrote "Dear Santa" in the December 1987 issue.

**What's the earliest flight
out of Chicago?**

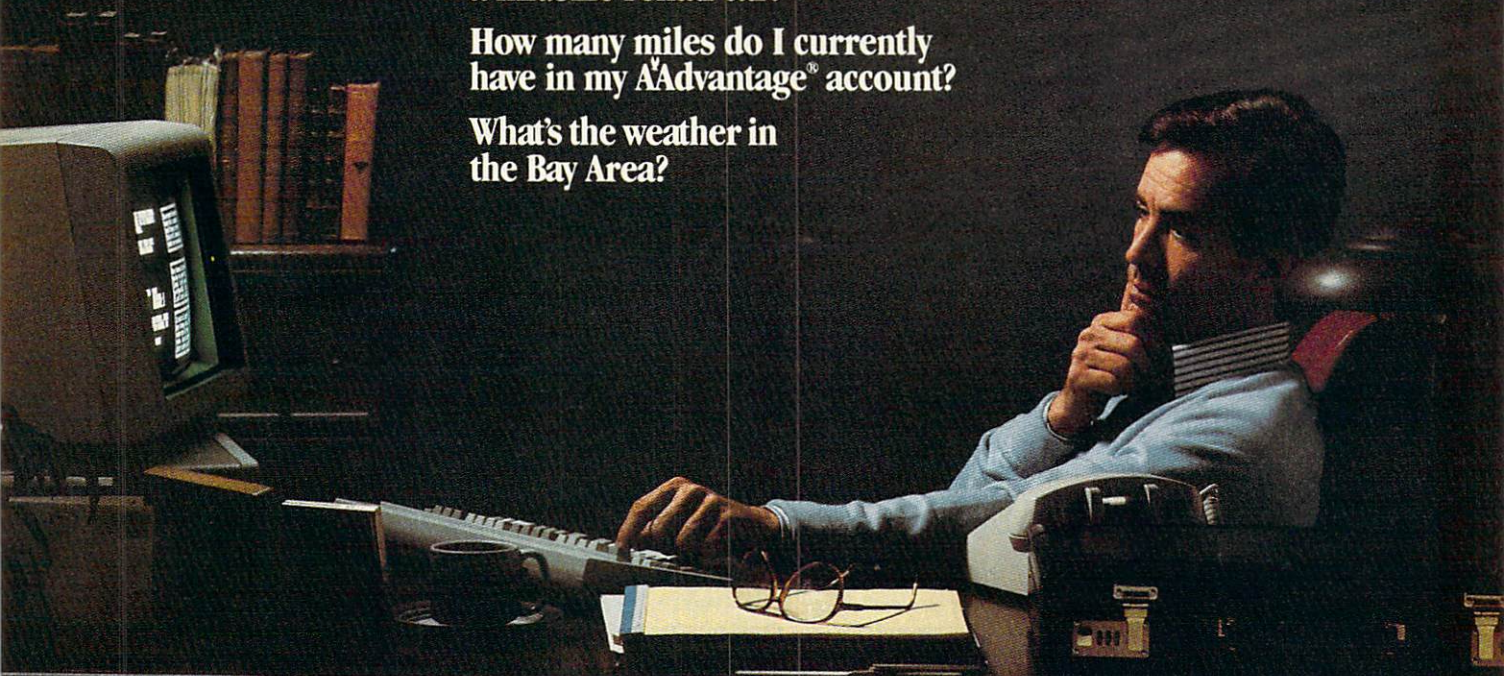
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CIRCLE READER SERVICE 2

TELECOMPUTING

VOICE MAIL

Tailor Your Telephone System to Your Business With a Computerized Answering Machine

BY ERNEST PEREZ

Telephone tag, the great American pastime, can be a great waste of time. The problem, of course, is making telephone contact with the right person at the right time.

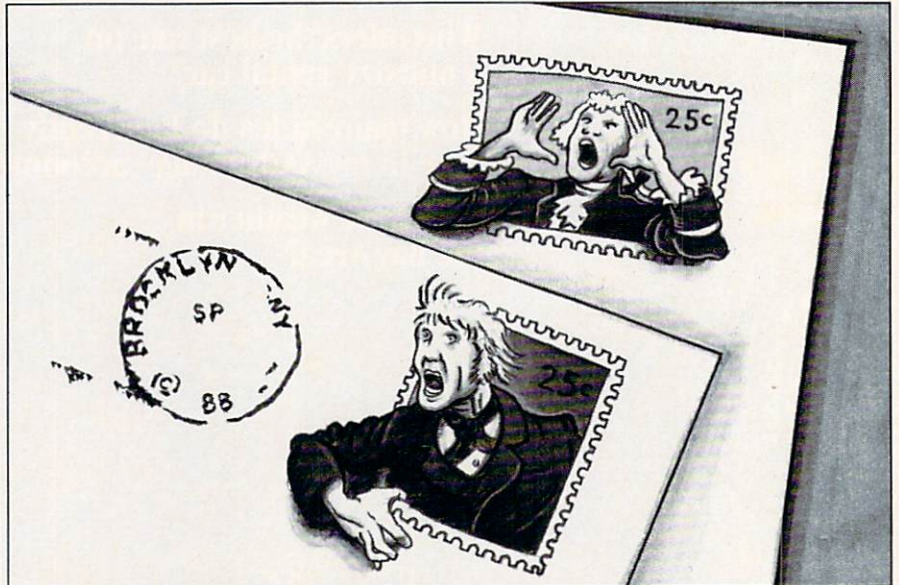
An answering machine helps an individual function without a secretary, but its usefulness is limited. What if you want an answering machine that will leave a personal message for each person you expect to call? Or one that calls you when someone leaves a message? Or that will actually send messages to other systems? Computerized voice-mail systems can do all that. And you don't have to be a large company to set up one. Primarily, you'll need an IBM-compatible computer with an empty expansion slot.

Voice-mail systems, used primarily by large companies, answer with computer-controlled recorded messages that guide you in using "touch-tone" selection to issue commands. For instance, you can use touch-tone commands for automatic transfer to the exact department or individual you want to contact. And, if the person is not available, you can leave a recorded message in his or her private "voice mailbox." By giving a touch-tone password, mailbox "owners" can pick up messages from any remote touch-tone phone.

If you are calling for specific information, you may even be able to use touch tones to select from a menu of recorded messages for quick answers.

VOICE-MAIL FEATURES

Both Watson and Complete Answering Machine (CAM), the two leading voice-mail products (see "Voice-Mail Systems"), are IBM-compatible add-on cards, which connect to the telephone line and come with



voice-mail software. You leave messages by talking into the telephone; you customize the system through the software. The systems are used primarily by small businesses and home-based professionals—people who most need to upgrade their telephone systems.

Basic System. Basic system capabilities include call transfers to specific extensions, voice-mailbox message taking, and selection of prerecorded informational messages, advertising or product information, for instance. Touch-tone selections will interrupt the greeting message at any time, so experienced or frequent callers don't have to waste time waiting to hear the full message.

Private Mailboxes. Touch-tone phones can also select mailboxes or areas not even mentioned in the greeting message. These "private" mailboxes can be used for personal messages from family, friends, colleagues, or clients. You can even create a group mailbox, where any caller or members of a particular group can share messages and pickups.

Outgoing Calls. Voice-mail systems can also initiate calls. With "message forwarding," the system will call another number to relay callers' messages.

You can also program the voice-

mail system to make unattended outgoing calls of several types. The simplest use is telemarketing—or calling a list of people to deliver sales or marketing pitches. With optional software modules, you can add interactive features, so that the message will react to touch-tone response. For instance, "If you'd like to find out about men's clothing specials, please press touch-tone 1 at this time; if you'd like to hear about women's items, please press touch-tone 2," and so forth.

Hard Disk Needed. Both voice-mail products can be upgraded to handle multiple phone lines. However, you'll need the speed of at least an AT-type computer for multiple-line operations. As it is, voice mail requires a hard-disk drive. These systems store speech in a digitized format—and digitized speech takes up a lot of disk space. For instance, CAM uses about 1MB of disk space to hold five minutes of speech.

Background Operation. Both Watson and CAM run in "background mode," managing your voice mail-system while you use other software. But, in practice, this causes undesirable delays that will be annoying to callers. Thus, it's more practical to dedicate a computer to voice-mail operation. The advantage and effi-

ERNEST PEREZ, who works in the circulation department of the Chicago Sun-Times, wrote "Remote Control" in the June issue.

ciency of voice-mail systems may make it quite profitable to dedicate an inexpensive IBM compatible to the task.

PRIVATE EYE WITH A COMPUTER VOICE

Armando Lopez, a private investigator and hotel-security consultant in West Los Angeles, uses The Complete Answering Machine (CAM) in connection with a paging system.

If a client calls Lopez's home-office phone and no one is there, a recorded announcement invites the caller to leave a voice-mail message. Clients are asked to "press 3" and give their passwords. Upon receiving a client's call, the machine takes a voice message and automatically dials a local computerized paging service, which in turn signals Lopez's paging device. The pager displays a number that tells Lopez which voice mailbox to call. "I usually pick up the message and get back to the client within five minutes," says Lopez.

Lopez also uses CAM's outgoing message function to contact witnesses for setting up appointments.

"Otherwise, it's a time-consuming job; some are very hard to reach," he says. He records an outgoing message explaining the reason for the contact and requests an appointment. CAM asks the person to use the touch-tone codes to accept the appointment or to leave an optional voice mailbox message.

"Although some people don't like to talk to a recording," he says, "if I can reach 2 or 3 out of 10 witnesses, the system has already saved me a great deal of time and trouble."

"I've had CAM for eight months and am really happy with it. It used to be that when I was away, my PC was just sitting there collecting dust," Lopez says. "Now it's doing something useful all the time. CAM has more than paid for itself."

A SOPHISTICATED ANSWERING MACHINE

Most people would benefit from a simpler use of voice mail. For instance, Sherry Martin, of Waltham, Massachusetts, a computer-training specialist and consultant, uses the Watson system as a "super-smart" answering machine to support her consulting business, Computers Without Fear.

Even though Watson is a very sophisticated system capable of advanced voice-mail operations, Martin

VOICE-MAIL SYSTEMS

The Complete Answering Machine (CAM) \$349

The Complete PC
521 Cottonwood Drive
Milpitas, CA 95035
(408) 434-0145. To sample CAM voice-mail system, call (800) 634-5558.

CAM is an easy system to get up and running. It features a friendly menu interface with complete Help screens at every point. However, it's not as sophisticated as the less expensive Watson.

Watson (P/N 8018), \$199

Watson VIS (P/N 8033), \$399

Natural Microsystems Corporation
8 Erie Drive
Natick, MA 01760
(800) 533-6120. To sample the Watson

voice-mail system, dial (800) 6-WATSON.

Watson is a good value, especially since the board also includes a 1200-baud Hayes-compatible modem. The Quick-speak speech synthesis module (\$199) converts text data in ASCII files into synthesized speech; the dBSpeaker module (\$75) lets users access dBase data files from touch-tone telephones. Watson, however, is more difficult than CAM.

says the messaging function "is really all I need right now."

If Martin's not available, the voice mailbox will take her clients' messages. If she's out of the office, Martin usually calls in to get the messages in her mailbox, just as she would do with a regular answering machine.

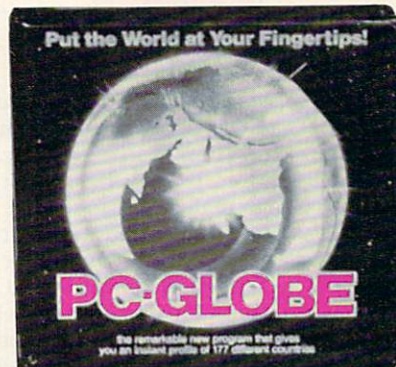
But Watson can outdo an answering machine. Martin occasionally uses the message-forwarding feature to relay her voice mail to another number. And regular clients are assigned their own mailboxes so that they can dial back later for a response to their questions. And sometimes, Martin uses the outgoing message feature to respond to clients' questions.

"Watson gives me the appearance of 24-hour business coverage," says Martin. "And I think the world is moving that way in general."

BETTER CLIENT SERVICE

Voice-mail systems can transform your telephone into a powerful communications system that will quickly pay for itself with added income or efficiency. Most important, voice-mail systems let the home-based professional or business owner quickly achieve a higher level of efficiency, client service, and perceived competence. ■

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CIRCLE READER SERVICE 7

JULY 1988 13

MACHINE SPECIFICS

NEWS, OPINIONS, QUOTES, AND RUMORS ABOUT YOUR FAVORITE COMPUTER

APPLE

BY CHARLES H. GAJEWAY

APPLE II

When Apple spun off all its software products to the newly formed Claris Corporation, there was a great deal of anticipation. How independent would Claris really be? How good would it be? When would the software arrive, and what would it be like? Now that most of the initial Claris products have been released, we can begin to get some answers.

AppleWorks Under Claris. Although Claris is basically a Macintosh company, it inherited *AppleWorks*, the second most popular program in computer history, after Lotus 1-2-3. With the current release, you now get a set of 3.5-inch disks, a somewhat revised manual, and most important, a 14-hour help line. As a gesture of good faith, Claris has also renewed Apple's lapsed upgrade policy; older versions of *AppleWorks* can be upgraded for \$75. Considering that the upgrade was unavailable for some time and that Version 2.0 lists for \$249, this is an offer to take advantage of immediately, especially for those of us still using ancient and creaky Version 1.0.

Apple CD-ROM. Apple is one of the first major computer manufacturers to market a CD-ROM drive under its own name; this should accelerate development efforts by expanding the potential market for CD products. CD-ROM disks are high-storage compact disks. They store graphics, text, and music that can be read by a computer.

The new Apple CD SC (\$1,199) is a CD-ROM drive designed to connect to an SCSI port on either an Apple II or a Macintosh. (An SCSI card for the Apple II costs \$129.) The CD SC provides more than 550MB of information storage, plus the ability to play audio CDs!

MACINTOSH

For the Mac, Claris offers *MacWrite 5.0*, *MacPaint 2.0*, *MacDraw II*, and *MacProject II*. These programs will now run under MultiFinder on the Mac II and SE (2MB minimum), but won't work on a 128K machine.

(They also work without MultiFinder on either system.) Neither the *MacWrite* nor *MacPaint* upgrade was done by the original author.

MacPaint 2.0. *MacPaint 2.0* (\$125) has been updated with the latest Mac conventions. It can open up to nine windows of up to 8.5-by-11 inches, take "snapshots" of drawings at various stages, draw an object from its center, and draw and select areas larger than those of the display.

Perhaps the most striking change is the movement of the drawing tools and pattern palette into the main menu bar. And the menu item now has the *HyperCard*-like "tear-off" feature, so that you can open the toolbox from the menu, then move it anywhere on the desktop for convenient use, closing it back into the menu bar when you need the whole screen active. The new features bring the venerable *MacPaint* completely up-to-date, except for its capability to work on-screen at laser-printer resolution.

MacWrite 5.0. *MacWrite 5.0* (\$125) was a different story. The biggest improvements are the addition of a spelling checker and an extension of the ruler to 10.5 inches in landscape mode. Search-and-replace and large-scale font changes are still slow (even on a Mac II!), and you still cannot search for carriage returns or nonstandard line spacing or open more than one document at a time.

Admittedly, *MacWrite* is a general-purpose, entry-level program that is easy to learn and use. I just wish Claris had added performance and features for more advanced users.

Claris Tech Support. Other aspects of the new products and support are top-notch. Packaging and manuals are first-rate, and Claris has instituted a technical-support number, something that Apple never had for its software products. The new company's commitment to user support is evident from the Monday through Friday 6 a.m.—8 p.m. PST technical support hours.

In addition, Claris's upgrade policies are quite liberal. To receive the new version, call (800) 544-8554 for upgrade forms, then send them in with your original disk, plus \$25 for

MacWrite or *MacPaint*, \$100 for *MacDraw II*, and \$145 for *MacProject II*. Claris will then send you the new, improved versions. The offer is good until September 30.

Mac Plus Price Drop. In March, Apple announced an 18-percent reduction in the list price of the Plus, which should translate into a \$1,300—\$1,500 selling price. Apple also announced list-price reductions of 13–15 percent on its line of external SCSI hard disks. According to Charles Boesenberg, an Apple senior vice president, "With the price reduction, Apple is making Macintosh technology available to a larger group of computer users. . . . The Macintosh Plus is now positioned to reach the more value-conscious markets of home business and small business."

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ATARI

BY MATTHEW STERN

Most people think desktop publishing is restricted to IBM-compatible and Macintosh computers. But the Atari ST and Mega ST computers offer a full range of desktop-publishing products. Software such as *Publishing Partner* (Soft-Logik; \$90) and hardware such as the Atari laser printer enable you to assemble a relatively inexpensive and complete desktop-publishing system.

Page-composition software—the basis of desktop publishing—allows you to arrange on the page pictures and text you've created with other programs. The pages are then laser printed to produce attractive newsletters, ads, and brochures.

Desktop Publisher ST. The newest page-composition program for the ST is *Desktop Publisher ST* (Time-works; \$130). It integrates text files and pictures by pasting them into boxes called frames. You can arrange, move, and resize frames on the page. Text will automatically wrap around any pictures you place over it.

Desktop Publisher ST offers a

number of design tools that other ST programs don't. As in the popular *Ventura Publisher* for the IBM, stylesheet tags save your frequently used paragraph formats. For example, you can create a style called *Headline* that automatically sets text in 36-point Swiss font. If you change the *Headline* style to 24-point Dutch, all the paragraphs with that tag will change automatically. You may assign tags to the function keys for convenience.

Desktop Publisher ST also includes some drawing and editing tools. Search-and-replace commands let you make last-minute changes in your text. A graphics editor can produce simple line art. However, you'll normally use graphics programs and word processors to do art and copy.

Print quality is an important consideration in choosing a page-composition program. *Desktop Publisher ST* can produce top-quality printing on 9-pin and 24-pin dot-matrix printers. It also supports HP LaserJet, Atari, and PostScript laser printers.

Graphics Programs. Since the graphics tools in *Desktop Publisher ST* are limited, you'll probably choose to use a dedicated program. You'll find two types of graphics programs for Atari computers: drawing and object-oriented graphics programs. Both types are suited for creating charts, maps, and artwork to paste into page-composition programs.

With a drawing program, you create pictures just as you would draw them with paper and pencil. You sketch shapes, fill areas with color, and erase sections of your artwork. *DEGAS Elite* (Electronic Arts; \$60) is perhaps the best of the ST drawing programs.

Object-oriented graphics programs, such as *Easy-Draw* (Migraph Inc.; \$100), create pictures by assembling different shapes and elements. Each curve and line you draw is treated as a separate object. You can change the arc of individual curves or group objects together to form a single image. *Easy-Draw* also enables you to add text in different type sizes, fonts, and styles.

Drawing programs offer greater flexibility and artistic expression. Object-oriented graphics programs are ideal for technical drawings, charts, and other graphics that require precise rendering, and they

usually print better than most paint programs do.

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BY HENRY BEECHHOLD

Suppose you can no longer avoid the plain truth: your friendly PC is beginning to take on the character of a museum piece. At the same time, you are just not ready to buy a PS/2 model. Wouldn't it be nifty to spend "just a little" and turn your old 8088 huffer-puffer into a 10MHz AT work-alike? You can do it (I did!) with the AST Hot Shot/286 (AST Research; \$645), a half-size board that allows you to use either your original processor (8088) or the faster AT processor (80286) at the touch of a "hot key."

AST Hot Shot/286. To install Hot Shot, you pull out your 8088, plug it into a socket attached to a cable, and plug the cable into the 8088 socket at one end and the Hot Shot/286 board at the other. The board itself is plugged into an empty expansion slot in your PC. None of this is difficult; you just have to be careful not to bend the pins of the chips.

The software consists of a driver (FDD.SYS) that must be added to your CONFIG.SYS file (DEVICE=FDD.SYS) and two utility programs. One customizes the hot key (ALT-8 is the default) and the other (HOTSHOT.COM) can be added to your AUTOEXEC.BAT file to boot up your computer in the 80286 mode.

But until you're sure that your software can deal with the high-speed operation of the new processor, AST recommends starting in the slow mode. A possible problem that AST doesn't mention is that of video board incompatibility. I found that low-cost, slow-speed video boards—you know, the ones with strange names—tend to lock up when being lashed by the Hot Shot/286. So be prepared for the possibility of upgrading your video board.

Does Hot Shot Make Sense? For me it does. I'm not ready to make the Big Move to a PS/2 yet, but I want 80286 speed. This desire is met at an affordable cost, and I'm still sitting at the controls of a reliable computer that has served me well for a long time. And if speed is really your

game, Hot Shot has a slot for a high-speed 80287 math co-processor.

Making Connections. You'd like to access a host computer that wants to talk to, say, a DEC VT100 terminal—or some other terminal configuration. Softronic's *Instant Terminal* (\$95 includes three terminal emulations) not only will turn your computer into the terminal of your choice, but also will provide a complete communications system. The program is a snap to use. The tutorial and reference manuals should answer all of your questions.

The same company offers a more expensive program called *Softterm PC* (\$195), which gives you instant access to 55 different terminal emulations, as well as LAN support, concurrent background operation, security log-on and callback, job-queue management, and just about every other telecommunications feature you could want. With *Softterm PC* on board, you'll probably never need another piece of communications software.

HENRY F. BEECHHOLD is author of *The Brady Guide to Microcomputer Troubleshooting & Maintenance* (Brady Books, Prentice Hall Press, New York).



BY STEVE MORGENSTERN

In mid-March, Apple launched a lawsuit against both Microsoft and Hewlett-Packard. The suit claimed those companies were infringing on the copyrighted Macintosh "audiovisual computer display" with their *Windows 2.03* and *NewWave* products, respectively. Apple says the audiovisual display makes the Macintosh "unique and distinctive" and "user-friendly."

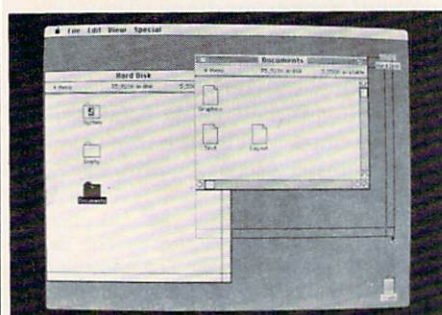
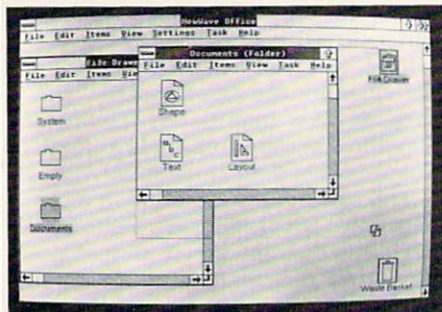
According to Apple's lawsuit, *Windows* is a desktop environment that uses drop-down menus and brings point-and-click techniques to MS-DOS machines. And *NewWave*, due to ship later this year, adds Mac-style icons to the *Windows* environment.

Breaking Windows? You want complex relationships between the protagonists? Apple is suing Microsoft, which publishes some of the most popular software for the Macintosh—such programs as the *Excel* spreadsheet and *Word* word processor that had a key role in making

MACHINE SPECIFICS

the Mac a serious contender in the corporate office.

In his recent book, *Odyssey*, Apple CEO John Sculley addressed the rumors of an Apple-Microsoft lawsuit: "If we sued our most important software supplier, our business customers would think we'd lost our minds."



In this photograph released by Apple, the company tries to show that HP's NewWave (top screen) infringes on the copyrighted Macintosh visual display (bottom).

So what happened? Apple is reacting to changes in another relationship—the joint development of the *Presentation Manager* by Microsoft and IBM. It is OS/2 with *Presentation Manager*—a Mac-like environment designed to bring ease of use to the MS-DOS world—that is the key to IBM's strategy for the future. *Presentation Manager*, scheduled for release later this year, is expected to closely resemble *Windows 2.03*. It's being designed to provide IBM users with two key features—a point-and-click desktop environment and consistent operation between applications.

Is OS/2 Stymied? So we have a complex lawsuit that has people scratching their heads. After all, as Apple founder Steve Jobs noted in a recent speech, Apple designed its Mac interface using many techniques originally developed by Xerox at its Palo Alto Research Center (PARC). Thus it seems its right to claim originality for such concepts as windowing is open to question.

This is a critical period for OS/2.

Corporate America has been slow to adopt the version on the market today, waiting to see what advantages *Presentation Manager* brings. *Presentation Manager* is nearly worthless by itself—it requires software developers to create new programs and drastically overhaul existing applications to make use of the new interface. Will developers invest time and money when there is a question about if and when *Presentation Manager* will hit the market? Will the lawsuit prove to be a delaying tactic or a deathblow?

New Lotus Delayed. Lotus has announced that the new version of *1-2-3* (Release 3, \$495), originally promised for mid-1988, will not ship until the end of the year. That's good news for the strong newcomers in the Spreadsheet Wars, Borland's *Quattro* (\$248) and Microsoft *Excel* (\$395) for the PC, for instance. *Quattro* costs about half as much as *1-2-3* does and offers significant speed and graphics improvements, plus full compatibility. *Excel* demands an AT-class computer and costs almost as much as the current release of *1-2-3* does, but offers many significant features unavailable in Lotus's aging product.

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TANDY

BY STEPHEN MILLER

The original Tandy 1000 was a big hit, but it did have limited expansion potential. There were only three open slots, and one was needed to add a serial port or a modem. However, Merak Industries of Warren, Michigan, is offering a low-cost way to add four extra expansion cards inside the 1000. Addcard for the Tandy 1000 (\$89) is user-installable. With the multitude of add-ons available, the Addcard is a plus for those 1000 owners who need to upgrade but have run out of slots.

CoCo Desktop Publishing. Two new programs allow CoCo 3 owners to produce their own newspapers and newsletters. *Home Publisher* (cat. #26-3273, \$40) was developed by Spectral Associates but is being marketed by Tandy. *Home Publisher* is one of the first programs I've seen developed to take advantage of OS/9 Level Two and the Multi-View operating environment.

Although that's a plus, the program is not for the novice publisher. *Home Publisher* produces newsletters and other graphic and text documents that have respectable quality. But the program is not as "user-friendly" as it could be. Knowledge of printing terminology would be extremely helpful. Or maybe it's just the tedious and unfriendly documentation. At several points it stresses that you should read the manual thoroughly before trying to use the program. Take the advice! I suspect that *Home Publisher* is the most powerful desktop-publishing program for the CoCo 3, but it will take some time to master.

The Newspaper (Spectrum Projects, \$49.95 plus \$3 shipping), on the other hand, is a much more modest program and certainly easier to use. I liked the colorful menus and the fact that you can operate it with just a glance at the manual—which is only 15 pages. Maybe it would be a good idea to use *The Newspaper* first to get a feel for desktop publishing and then move up to *Home Publisher* when more power is needed.

Bye-Bye TRSDOS. Tandy has officially responded to all the rumors that it was about to introduce an improved Z-80 computer. According to Ed Juge, director of market planning and spokesperson for Tandy, the company will continue to support TRSDOS machines (for repair and guidance) but it is unlikely that any new machine will be developed or released. You can also add the CoCo 1 and 2 to that list of discontinued hardware.

STEPHEN MILLER is a computer consultant and journalist.

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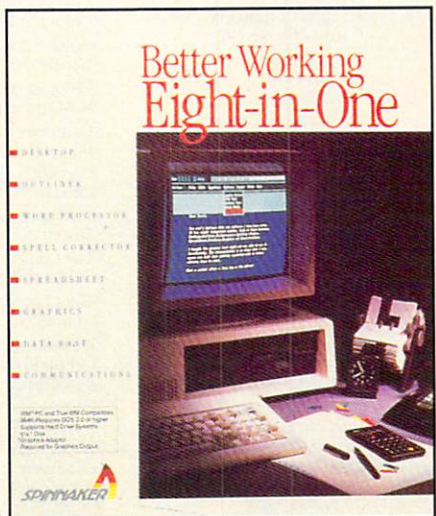
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EDUCATION

CAREER COUNSELOR-ON-A-DISK *Career Navigator: The Computer-Powered Job-Search System* BY MARY FANDEL

'Tis the season to be job hunting! I've been through this routine before—once after college, another time when I was changing jobs, and now as I finish up my MBA. I'm no stranger to the process, and yet, it never seems to become easier for me. I've always dreaded writing my resumé, asking for favors, setting up interviews, and trying to make that ever-important first impression.

But this time I'm ready! And the difference is that I am prepared. Job hunting is like preparing a presentation about yourself. You'll have to spend time and energy learning more about who you are, what you

job-search campaign.

The competition for jobs is tough, but with CN, I focused my job objective and learned how to present myself in a more sophisticated manner. I knew what to expect and the specific follow-up actions to take. Even the best candidates must get a foot in the door before they can prove themselves.

ORGANIZATION IS THE KEY

Organization is one of the greatest benefits of *Career Navigator*. The program provides a structure to follow. It details steps in the job-search process, eliminating most of the guesswork and saving time. And the personalized databases allow you to eliminate excess paperwork and filing. You'll appreciate the easy storage of career and work information when you think of all the job-interview letters, networking letters, and follow-up letters that are part of an effective job search. If organization is not your forte or if you just aren't familiar with what it takes to manage a job search, CN's structured format is a lifesaver!

There are six sections. **Start the Program**, the first section, helps you set up and use the program effectively. This section also asks for personal information. From the time you introduce yourself to CN, think carefully and give honest responses to the questions.

Know Yourself, the second part, incorporates your interests, values, and skills into career goals. One exercise lets you fantasize with such questions as "How would you spend \$10 million? How would you spend your time?" You may find a surprising pattern that leads to a career choice you never considered before, or you may realize that some of your expectations are impractical. You'll create a personal database by listing accomplishments and related skills.

Career Navigator's third section, **How to Communicate**, teaches you to be effective as you use the telephone, write letters, and interview. You can write and mail letters to any or all of the 100 organizations that you can store in the database. You'll answer questions in mock telephone conversations and interviews that lead you through job-finding scenarios. After

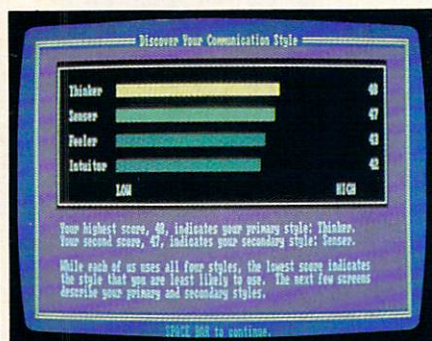
you select an answer, the program will explain the best way to approach the situation. How would you approach a known contact or a stranger in a telephone conversation? CN gives you sample scripts that let you know what to expect and build your self-confidence. Most important, you'll be coached to use your "communication style" effectively under different circumstances.

The fourth section, **Develop Your Job Search Tools**, teaches you to develop contacts, research organizations, create resumés, and obtain references. You'll draw from your personal database to draft a resumé and access a list of more than 20 directories and guides for researching organizations. To present yourself in the best possible light, CN encourages you to talk to people in your field and read trade magazines and company annual reports. You may have thought of family members, friends, professors, and others you know who may be able to give you a lead on a job, but CN prompts you to brainstorm and find even more contacts. You can routinely update this database as you make new contacts (this information will be invaluable to you in subsequent job searches). I've always felt uncomfortable asking friends for contacts and using someone's name to obtain an interview. Preparing with CN showed me that asking for leads is acceptable and that networking often leads to opportunities.

Conduct Your Job Search Campaign, the fifth part, helps you set up an overall Campaign Plan, Weekly Action Plan, and Assessment Plan. You'll maintain databases of your contacts and target organizations. Finally, when you're ready, **Land that Job** helps you negotiate and evaluate a job offer. There's even a section on surviving the first three months of a new job.

PUTTING CAREER NAVIGATOR TO WORK

After a good deal of self-assessment, I decided on a job target: a human-resources management position. I like working with people, and this job accommodates my strengths and desires. As a personnel manager, I would help businesses create



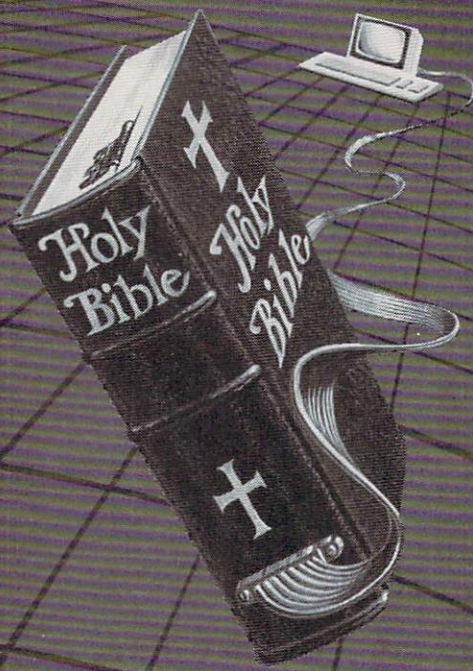
Discover your communication style.

want in life, and how to go about getting it. If you know yourself and what you're looking for, you'll carry that confidence into the interview room. The investment is high, but the payoff is even higher!

For most people, job hunting is a frustrating and confusing experience—but it doesn't have to be. Many job seekers choose career counseling to learn the right skills and use the appropriate tools. My school's career guidance center introduced me to a career-counselor-on-a-disk, *Career Navigator* (CN), published in 1987 by Drake Beam Morin, Inc., a leading career-counseling and outplacement firm. Using CN was an exciting and productive experience for me. This interactive program helped me to identify my career goals, learn important job-search skills, and develop a strategic

MARY FANDEL is a Babson College MBA graduate. She has recently accepted a job at the Polaroid Corporation as a personnel administrator supporting the finance division.

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CIRCLE READER SERVICE 11

EDUCATION

plans to manage people. I would assess the business's personnel needs, select and groom employees to fit the business's changing needs, and help employees achieve personal and professional growth.

I discovered a job lead by attending a symposium where one of the panelists was a human-resources director from a company I had targeted. When the question-and-answer segment came up, I raised my hand and posed a question. Later, at the reception that followed, I heard the director mention self-management, a relatively new concept in business that gives employees responsibility for their work life. Since I had worked in a company that used self-management, I was able to discuss this topic with the director and establish some common ground. At the end of our conversation, my new contact told me that his company was recruiting for a position that was in line with what I was seeking. I followed up with a letter, mentioned his name, and set up an interview.

The time I spent learning about myself, combined with hours of preparing answers to CN's interview questions, prepared me for the first interview. The interviewer posed a series of questions about my strengths and weaknesses, the kinds of rewards that were important to me, and the goals I had set for myself. Because I knew the answers to those questions, I could respond with well-thought-out answers that didn't sound rehearsed. All the preparation paid off: I've had four successful interviews, and as I write this, the company is putting forth an offer package. ■

ABOUT THE PROGRAM

Career Navigator is a comprehensive program, consisting of four disks and an invaluable handbook (including software instructions). The handbook includes true/false quizzes, worksheets, short case studies, as well as sample letters, resumes, and interview sessions. The entire package sells for \$129 and is discounted to \$100 for students and educators. It runs on a 256K IBM PC or compatible and requires DOS Version 2.0 or higher. Access to a printer is essential. (Don't forget to use the "print screen" function key to obtain a printout of any information on the screen that is not automatically printed.) Drake Beam Morin Inc. provides telephone support. The program may be ordered by calling (800) 345-JOBS. (Refer to the Software Guide section for an evaluation of Career Navigator.)

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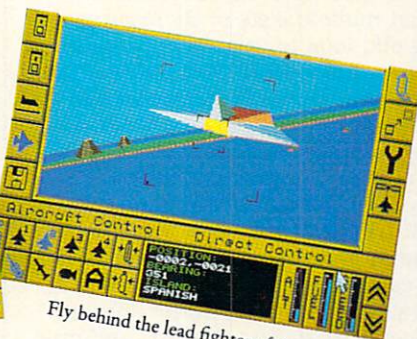
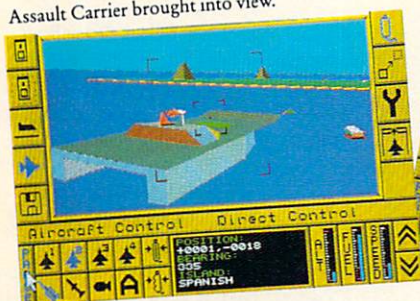


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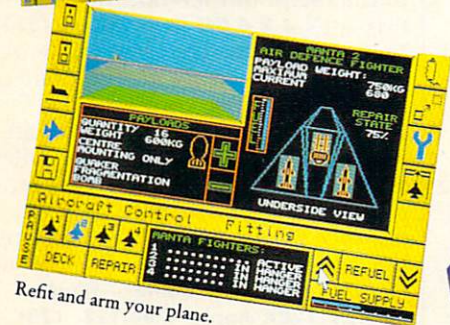
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Refit and arm your plane.



Screenshots from Atari ST.
Telecom Soft, P.O. Box 2227, Menlo Park, California 94026.

ENTERTAINMENT

HINTS, NEWS, AND NEW GAME FORMATS

NEWS AND RUMORS

★ What's software designer **Brian Fargo** and his company, **Interplay Productions**, been up to post-*Bard's Tale III* and *Wasteland*? We talked with Fargo and found that he's been hard at work—in good company. Counter-culture guru **Timothy Leary** is a collaborator, and the techno-pop group **DEVO** is doing the sound track for Fargo's next software project, **Neuromancer**, based on the sci-fi novel by **William Gibson**. (We also hear that "Neuromancer" will be a major motion picture.) In *Neuromancer*, Fargo and the other Interplay designers model a future universe where computer hackers break into Cyber-space, a huge information matrix. You'll crack into databases and networks and have access to more RAM, more software, and more hardware than you ever thought possible. *Neuromancer* (and all future Interplay products) will be distributed by **Activision**. *Neuromancer* will be available for the **C 64/128** this fall; **64K Apple** and **256K IBM PC** versions will follow.

★ Speaking of **Activision**, the company has just released **Rampage** (**128K Apple, C 64/128, 512K IBM PC**; \$35–\$38), an action game fashioned after



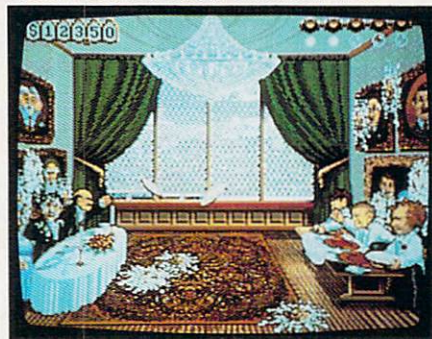
Rampage, an arcade-style game from **Activision**.

one of last year's hottest arcade games. You'll play one of three monsters (gorilla, lizard, or wolf) on the loose, spreading havoc and destruction in up to 157 American cities and skylines from coast to coast.

★ We went straight to the source to dispel rumors that **Alternate Reality: The Dungeon** would be the last release in the *Alternate Reality* series. **Data-soft** president, **Samuel Poole**, told us

that, indeed, a third chapter is being designed. Right now, the title is **Alternate Reality: The Arena**, but that may change. We'll keep you posted. . . . Two more Data-soft games are ready: **Cosmic Conflict: Prof. Renegade to the Rescue** (**512K Amiga, 512K Atari ST, C 64/128**; \$25–\$35), a humorous, animated, adventure game, and **Napoleon in Russia** (**48K Atari, C 64/128**; \$25), a war-strategy game.

★ "Nyuk, Nyuk," it's The Three Stooges to the rescue in **The Three Stooges** (**C 64/128, \$35; 512K Amiga, 256K IBM PC**; \$50), **Cinemaware's**



The Three Stooges, a graphic adventure from **Cinemaware**.

homage to the great film comedy threesome. **Moe, Larry, and Curly** must make assets of themselves doing odd jobs to earn money to save a widow, her beautiful daughters, and their orphanage from an evil banker who wants to foreclose their mortgage. *The Three Stooges* is a farcical, interactive, graphic adventure that's structured like a board game. You'll nail "richies" at a society pie fight, masquerade as a doctor to steer a go-cart through the hospital corridors, slurp seafood in the annual oyster-stew-eating contest, and answer "The Three Stooges" trivia questions. The game includes sound effects digitized from the original sound tracks. . . . If you're old enough to remember Saturday morning matinees when you plunked down a quarter for a feature film, eight cartoons, a short subject, and a chapter of a Hollywood serial, you'll want to grab a copy of **Rocket Ranger** (**C 64/128, \$35; 512K Amiga, 256K IBM PC**; \$50) from **Cinemaware**. You're a young American scientist in the 1940s, and one day, a rocket suit, a jet pack, a ray gun, and other space-age accessories materialize on

your desk. The attached note, dated 2141 A.D., bestows a mission upon you: save history and the world from an ensuing German victory in WWII.

★ **Accolade** is retiring some popular titles into its new line of **All Time Favorites**, which will sell for \$15 apiece. **Ace of Aces, Fight Night, Dam**



Ace of Aces, from **Accolade's All Time Favorites** line, costs \$15.

Busters, Killed Until Dead, Law of the West, and Hardball (which has sold more than 250,000 copies) will start the lineup. . . . **Accolade** also released **Bubble Ghost** (**512K Amiga, 512K Apple IIcs, 512K Atari ST, C 64/128, 256K IBM PC**; \$30–\$45), a sophisticated arcade game featuring a ghost who blows bubbles through the rooms of a castle.

★ Play ball! **Sporting News Baseball** (**128K Apple, C 64/128, 128K IBM PC**; \$40), **Epyx's** new baseball simulation, is co-designed and endorsed by *The Sporting News*, the "Bible of Sports." Recruit your team from the 26 major league ball clubs or mix new players with all-stars from the past to create a "dream team." . . . Hold onto your hats! **Epyx** takes you to the races, but it's not the **Grand Prix**—it's **4 X 4 Off Road Racing** (**512K Amiga, C 64/128, 128K IBM PC**; \$40). Choose your own rig and equipment to climb hills, bog through mud holes, and make your way through the challenging terrain of four different courses. It's a multiple race season where strategy, skills, and endurance figure greatly. . . . And **Epyx** has added a new title to the popular **Games** series: **The Games—Winter Edition** (**128K Apple, C 64/128, 128K IBM PC**; \$40), set in **Calgary, Canada**. There are seven events: figure skating, speed skating, downhill skiing, slalom skiing, ski jumping,

KOEI

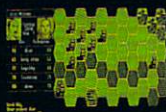
**More than
five years
a best seller**

**Greatest
simulation game
released in Japan**



\$59⁹⁵

Nobunaga's Ambition
The Struggle to Unite Japan



For the IBM PC and most compatibles.

The Japan most people don't know about. The Warring States period of the sixteenth century. Central government was weak and ineffective as feudal lords called daimyos gained power. Each daimyo ruled a single fief, each wanted to rule the nation. One man, Nobunaga Oda, came close but failed. He paid the price for failure, death.

Nobunaga's Ambition is a military, economic and diplomatic simulation for one to eight that puts you in Nobunaga's place, or in the place of one of his rivals. You start with one fief and try to take the entire nation. A game of both strategy and tactics, success takes careful planning and opportunism.

Administer your fiefs during peace to increase their strength. Keep your peasants and army loyal or risk revolt. Use your resources effectively, not spending too much on either guns or butter. Negotiate with other daimyos, or perhaps you'd rather just send ninja.

On the battlefield, control your troops in close tactical detail. Take advantage of terrain, attack, retreat, fight a war of attrition or go directly after the enemy general. Just be sure your side is smarter, tougher and better prepared.

Nobunaga's Ambition is fast moving and easy to play but historically accurate. Characters and game events come from the reality of sixteenth century Japan. Maps are almost entirely accurate, both geographically and politically. Advanced graphics and animation help give the game a feel of complete reality. One to eight may play either of two scenarios and five different levels of difficulty. Instruction manual and historical notes included.

Some comments from Japan's leading computer magazines:

"If you own a computer you've got to try this game."

OH! PC
January, 1987

"If the user can supply intelligence and imagination, Nobunaga's Ambition will provide more and better entertainment than any other game on the market."

Enter
August, 1986

"First released more than five years ago, Nobunaga's Ambition is still not just a best seller but one of the very best simulation games on the market."

Popcom magazine
January, 1987

"Nobunaga's Ambition is the absolute pinnacle of simulation gaming."

Mainichi Shimbun
May 7, 1987

"A great hit"
Asahi Shimbun
February 20, 1986

"Far and away the most authentic simulation game I've ever seen."

Hiroharu Seki, professor of Political Science at University of Tokyo in an interview with *Tokyo Newspaper*.



\$69⁹⁵

Romance of The Three Kingdoms
Live Second Century China



For the IBM PC and most compatibles.

China's second Han dynasty has collapsed. The entire nation battles with itself as warlords struggle for supremacy. You are a Master, one of these warlords determined to beat out the others and control the country. Manage the states under your control to increase their power and resources. Cope with disasters, both natural and otherwise, when they occur. Choose good subordinates and win their loyalty. Negotiate with other Masters, or take a less diplomatic approach, controlling your armies and those of your generals in great tactical detail on the battlefield. Take advantage of terrain as best you can. Choose the right kind of attack for the situation, or just try and trick the enemy. Do what the immediate situation calls for but don't fail to think ahead.

A huge data base together with advanced graphics, animation and programming give the game an unprecedented degree of reality. Romance of The Three Kingdoms is based painstakingly on the Chinese epic novel of the same name, but is fast moving and easy to play. Features include:

- *255 characters, each with a distinct personality
- *Military, economic and diplomatic simulation
- *Five different scenarios
- *Ten levels of difficulty per scenario
- *Play by one to eight
- *Demonstration mode
- *Complete instruction manual and historical notes.

"Our highest accolade to Koei's Romance of The Three Kingdoms:"

Popcom magazine
May, 1987

"Highest award for a simulation game."

"All around best game."
Login
July, 1987

"A simulation game without peer."

Enter
August, 1986

"Romance of the Three Kingdoms is simulation gaming at its absolute best."

Technopolis
July, 1986

"Romance of The Three Kingdoms is a simulation war game that will strengthen any businessman's ability to work through a problem, logically or intuitively."

P. C. magazine
October, 1986

"Romance of the Three Kingdoms may be pricey but the entertainment it provides makes it a good buy at any price."

OH! FM
March, 1987

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ENTERTAINMENT

cross-country skiing, and the luge, and up to eight players represent the countries of their choice. . . . And **Street Sports Soccer (128K Apple, 512K Apple IIgs, C 64/128, 128K IBM PC; \$40)**, the newest addition to the Epyx *Street Sports* line, is soon to be released. Get the gang from the neighborhood together, choose your playing territory, and get ready for fast-paced, street-style soccer.

—LISA WU

GAME HINTS

THE BARD'S TALE III: THIEF OF FATE

(Electronic Arts). We went straight to *The Bard's Tale* designer Brian Fargo himself for these hints. In *Thief of Fate*, you'll return to Skara Brae, the setting of the original *The Bard's Tale*. Tarjan, the former master of Mangar, has taken over the city and plans to control time and space. You'll travel through seven dimensions to find him and stop him. (64K Apple)

★ When the heart begins to pump in the bowl, there will be a reaction—but it will be a delayed reaction.

★ In Gelidia, read the text in the hut carefully and think about which



The Bard's Tale III: Thief of Fate, from Electronic Arts.

spells to cast in the Ice Keep.

★ You may not want to kill Urmech.

★ In each dimension, first seek the city.

★ You'll need a thief in Malefia.

★ In Shadow Canyon, find the wall that you can pass through.

—BRIAN FARGO

DEATHLORD (Electronic Arts). *Deathlord* is a fantasy role-playing game based on Japanese themes. It takes



Deathlord, a role-playing game based on Japanese themes.

place in Lorn, capital of the Kodan Empire, where the emperor has been besieged by the Deathlord. You are the last group of warriors, and you may transfer characters from *The Bard's Tale*, the *Wizardry* series, and *Ultima III* to help you battle it out with the Deathlord. (64K Apple)

★ Assembling a strong group is important; the first three characters should be warriors. Try to get high points on their strength, constitution, size, and dexterity. Senshi are good warriors, but Yabanzin are better for hit points, depending on size and constitution. The fourth character should be a Shisai; the fifth, a Mahotsukai; and the sixth, a Genkai. The last three characters should be Toshi with high intelligence points, high power points, and at least five hit points.

★ Unless you want trouble with the guards, don't attack anyone or steal from a merchant in the town, city, or palace.

★ If you think there are no guards in Kawa, think again.

★ To get money and a ship, assemble a weak group of warriors and go to the city of Tokugawa. Find the shipyards and attack the merchant; you will win this battle. Then before the guards come, attack a ship; you will lose this battle. Reboot and assemble a strong group (see the first hint). Go to the city, smash the door (the door with the merchant standing in front), and divide the gold evenly. The boat you attacked will be empty; board and get on your way.

★ Be sure to check the outside walls of Tokugawa before you leave.

★ Before departing, be sure all the

warriors have the best weapons and the most suitable armor for their class.

★ Don't leave Kodan right away. Earn hit points by attacking the weak monsters you see on shore (wolves, skeletons, obakes, and brigands). When your characters earn pluses in front of their names, go back to the city. Enter the academy and pay the warriors at least 60 hit points; then your wizards can cast spells at level three.

★ There is an island south of Kodan.

★ Small islands can hold signs, dungeons, and other secrets.

—SHANE BIANCULLI, *Ford City*, Pennsylvania

CONVERSIONS

Maniac Mansion (Lucasfilm/Activision). Now available for 128K IBM PC. Already out for 128K Apple, C 64/128. Reviewed in February 1988 issue.

Test Drive (Accolade). Now available for 128K Apple. Already out for 512K Amiga, 512K Atari ST, C 64/128, 256K IBM PC. Reviewed in March 1988 issue.

Ultima IV: Quest of the Avatar (Origin Systems). Now available for 512K Atari ST, 256K IBM PC. Already out for 64K Apple, 48K Atari, C 64/128. Reviewed in February 1986 issue.

Wizardry II: Knight of Diamonds (Sirtech). Now available for C 64/128, 128K IBM PC. Already out for 48K Apple. Reviewed in January 1984 issue.

SEND US YOUR HINTS—AND WIN A FREE GAME!

Don't miss the opportunity to share your original game hints and tips with other readers. Submit entries to: Entertainment Editor, FAMILY & HOME-OFFICE COMPUTING, 730 Broadway, New York, NY 10003. Include your name, address, telephone number, a short description of the game, and the brand and model of computer you own. If your tips are selected for publication, we'll award you a new game for your computer. We reserve the right to edit submissions for accuracy, clarity, and length. Unfortunately, we won't be able to acknowledge each submission. ■

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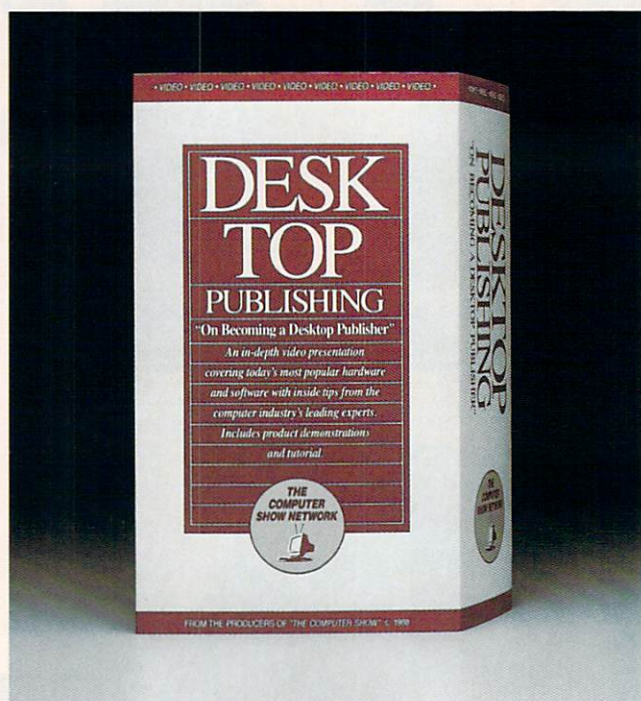
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is demonstrated by people who really know what they're talking about—senior executives from the companies that published the software in the first place.

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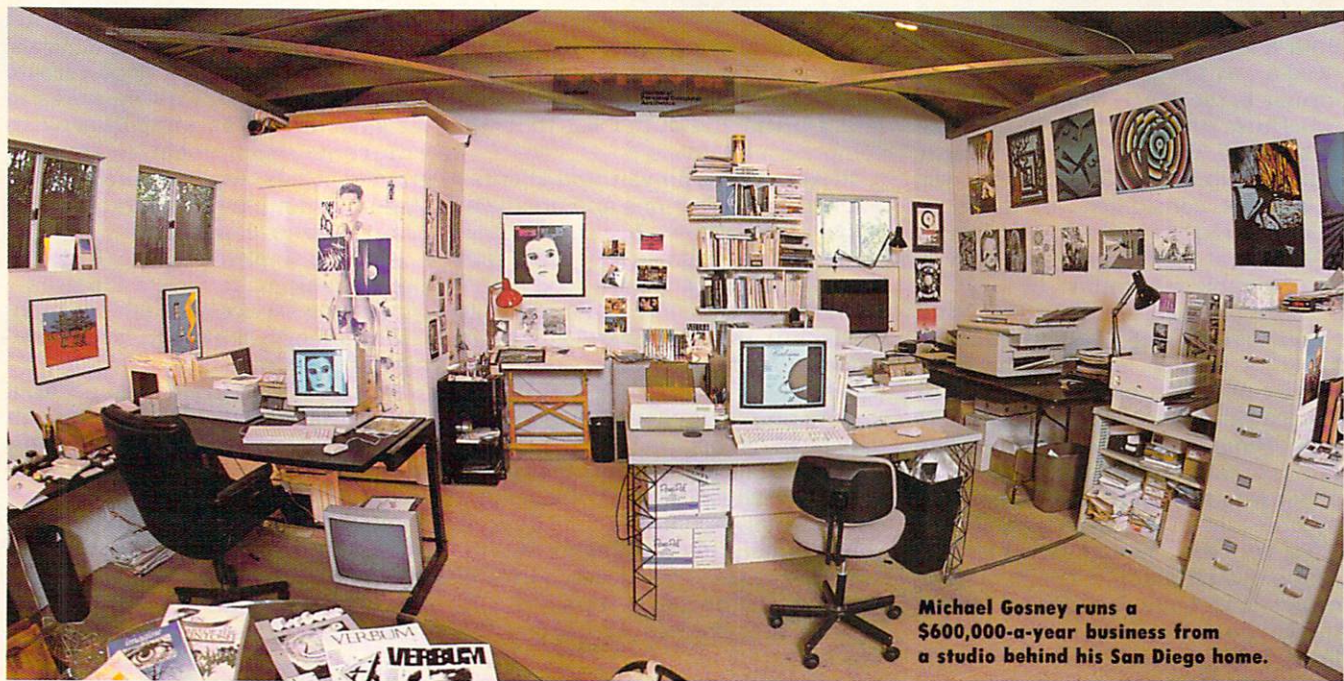
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THE COMPUTER SHOW™

How to Start and Run A Desktop-Publishing Business

YOU'LL NEED BASIC SKILLS AND AT LEAST A \$10,000 INVESTMENT TO INVADE THIS RIPE MARKET

BY LIS FLEMING



Michael Gosney runs a \$600,000-a-year business from a studio behind his San Diego home.

Michael Gosney began by holding a one-man show of Macintosh art in a local coffee house/gallery and is now publishing his own award-winning, internationally distributed magazine. Gosney took an interest and turned it into a desktop-publishing success. Gosney's *Verbum* magazine is a leading showcase of computer art, and the Donovan Gosney Agency is a \$600,000-a-year enterprise run from a studio behind his San Diego, California, house.

Gosney is one of a growing number of entrepreneurs setting up desktop-publishing services in homes all over the United States and Canada. What

does a desktop-publishing service do? Basically, it uses personal computers, desktop-publishing software, and laser printers to create printed materials. The laser printout can be photocopied or sent to a printer for a larger run.

What should you expect going into the desktop-publishing business? We asked several savvy entrepreneurs to share their experiences—how they got started, what skills they started with, how the business works, and how much money they're earning. Three are in the first year, or start-up phase, of business and are covering their initial investments. Three have established up-and-running businesses, which they depend on for a major portion of their income.

From their combined comments, we saw the way desktop-publishing businesses work. In addition, we pre-

sent short profiles of the six desktop publishers, each of whom brings a different style or approach to the work at hand.

STARTING THE BUSINESS

Before you begin to find clients and deliver products, you must get your system set up and running smoothly. Here's a quick checklist to get you going.

Skills. Successful publishers are most likely to have backgrounds in graphic arts, computers, or communications—or all three. If you don't know one phase of the business, you'll have to learn it or hire someone with that background. A basic knowledge of printing is certainly helpful, as is the basic motivation to publish. Expect to expend lots of energy training yourself to use the technology fluently and to keep up with advances.

Contributing editor LIS FLEMING wrote "20 Building Blocks for a Successful Home Business," the cover story for the May issue.

Space. Desktop-publishing operations take up space. You may start in a spare bedroom, but it won't be long before you take over the family room and part of the garage! In fact, the day may come when your desktop-publishing business becomes so large and demanding that you will have to leave home and rent commercial office space.

Hardware. Equipment costs range from \$10,000 to \$40,000, depending on the size of your operation. Macintosh and IBM are the two most commonly used personal computers in desktop publishing. Most publishers acquire more than one computer once the business starts moving, and many add a large-screen monitor to aid in page design. If you don't have both a Macintosh and an IBM, you'll need a way to convert disks from one format to the other, to satisfy clients.

Because the graphics in desktop publishing require speed, only the faster computers (10MHz and above) should be considered. In addition, graphics require memory—at least a 20MB or a 40MB hard-disk drive is the desirable minimum.

Laser printers, such as the Apple LaserWriter and Hewlett-Packard LaserJet printer, produce the near-typeset-quality printouts that can be turned into newsletters. Scanners (see "Buyer's Guide to Scanners" in this issue) "read" images or text from paper into the computer, where they become part of the desktop design.

To meet the demand for copies and sizing, you'll want a deluxe photocopier that reduces and enlarges at incremental scale and also sorts, collates, and produces automatic double-sided copies. Xerox and Canon are well-known names in the copier industry.

Finally, don't forget that you'll want to send work to clients electronically, so you may need a modem and an extra telephone line. Also, rather than laser print your final product, you may want to electronically transmit it to a typesetter—for a more professional look.

Software. You'll need an array of software. The crux of desktop publishing is page-layout software, which takes text files and graphics files and allows you to arrange the words and images on-screen. *Page-Maker* (for Macintosh and IBM), *Ventura Publisher* (for IBM), and *Ready, Set, Go!* (for Macintosh) are among the best-sellers.

Besides page-layout software, you'll need word-processing programs, graphics programs, and communications programs. And, if you want to

get fancy, you'll want to build up a library of fonts on disk.

Supplies. Besides all the usual office supplies any business needs, you'll need reams of inexpensive printer paper for test prints. Reams of expensive coated "enameled" paper will be needed for final printing. New ink cartridges for the laser printer can run \$100 apiece.

Since some desktop-publishing work is still best done by hand, such traditional pasteup tools as a drawing board, T-square, handwaxer, and double-sided studio tape are necessary to complete your setup.

RUNNING THE BUSINESS

In your first year of business, you should try to take on as many different jobs as possible. Some jobs will be more profitable and some clients more dependable. Eventually, you'll find a bread-and-butter list that will comprise a business.

Clients. Where do you find clients? Such local institutions and organizations as hospitals, health services, trade groups, women's groups, and mental-health groups are good places to start. They often can't afford to pay much, but at least they will give you a chance to get some "clips" and some practice.

More profitable clients include publishers of "shoppers," local newspapers, psychologists, attorneys, medical-marketing groups, physicians, educational consultants, computer consultants, financial planners, direct-mail houses, military academies, financial institutions, retailers, insurance brokers, manufacturers, and real-estate agents.

The steadiest sources of work are local printers and designers who "job out" projects.

Products. The types of product you can sell include brochures, charts, floor plans, architectural renderings, logos, business forms, resumés, marketing plans, business plans, newsletters, training manuals, business cards, questionnaires, directories, coupons, invitations, calendars, catalogs, handbills, admission tickets, raffle tickets, fliers, ads, yearbooks, manuals, magazines, books, mailing lists, budgets, and new business stationery (logo, envelopes, letterhead, and newsletter banners).

Services. Publishers provide a range of services, including layout, design, graphics, and production services, and delivery of the final product to the client on both paper and disk (in either Macintosh or IBM format). Final production includes proofreading, spell checking, and arranging for

editing and custom illustration.

In some cases, well-established publishers may charge 20 percent more for printing and pay the printer's bill themselves. The publisher with several computers may want to become a service bureau, renting computer time and use of the laser printer for less than one dollar per page.

Marketing. Successful publishers soon find that referrals and word-of-mouth advertising are the most effective ways to attract clients. Quality service and products bring new referrals and repeat customers. Delivering on time, always correcting errors, and being responsive to the varying needs of clients create customer satisfaction. Networking, speaking, and writing articles all bring referrals.

Support/Backup. It's a good idea to know everyone in town who works in the same field. Your support services will come from local designers, graphic artists, writers, editors, copy shops, computer consultants, and printers who can provide services needed to complete projects. It's especially important to have a Linotronic typesetting service available for high-resolution printing (when laser printing isn't good enough).

Backup services often come from "competitors." They lend equipment during emergencies, do overflow work during peak times, and offer technical and business advice.

Other backup help comes from freelance independent contractors (often home-based businesspeople) who provide layout, word-processing, or general office help. College students with good editing skills are especially helpful as part-time workers. As you grow, you'll have extra computers and software to lend to support people.

Pricing. In order to make a profit, you should base your proposals on a \$50-per-hour figure. The typical desktop-publishing price sheet lists services as follows: \$25–\$35 per hour for production, \$35–\$45 per hour for desktop layout, and up to \$75 per hour for creative design. The proposal for the client includes work from all three price ranges plus fees for arranging for additional services (printing, editing, copywriting, proofreading, and illustrating). The final price generally averages about \$50 per hour. New clients will be reassured by the price breakdown of services involved in the job.

You'll quickly learn that not everyone can afford your services. Refer those projects to local word processors who can produce an attractive

format with enhanced word-processing equipment. Desktop publishing is for the client with a middle-range budget who looks for quality design.

Income. During the first year, you should expect to break even, earning enough income (about \$20,000 full-time) to pay for equipment and supplies. During the second year, income should increase by about 50 percent, and the publishing business should become self-supporting. Thereafter, working full-time, you can earn \$40,000 and above. A half-time desktop-publishing business can earn \$20,000 a year.

Competition. At this stage of the game, you'll find plenty of work to go around. It shouldn't worry you that more and more people are learning to use the software or that some of your clients eventually begin to do their own in-house desktop publishing.

These changes create new opportunities for you to provide consulting and training services. Furthermore, improved desktop-publishing programs become more and more sophisticated and memory intensive, so that most in-house desktop publishers will continue to rely on outside specialists to provide high-end work.

YOU GOTTA LOVE IT

Most businesses fall into one of two categories: a service business or a product business. The desktop-publishing business blends service and product. To run it well, a proprietor must have technical skills and enjoy dealing with the public. All the people we interviewed said they wouldn't be running a desktop-publishing business if they didn't love it. One says, "You really have to like working with the software." Another agrees, "I'm having a ball! I love jumping into other people's crises." Another reports, "It's really more like a hobby for me!"

THE START-UP ENTREPRENEURS

MARGARET COLE: INFOTEK SYSTEMS

Margaret Cole's business is invading her Dallas, Texas, home. So far it has taken over the loft office, the downstairs den, the dining-room table, and part of the garage. Her fascination with desktop publishing began when she started using the Macintosh; however, her professional background in education, sales, and marketing and her experience as a project manager for a training company all contribute to her business success.

Cole uses *PageMaker* on her Macintosh SE, with a 20MB hard-disk drive, which is linked to an Apple LaserWriter Plus printer. She also uses DaynaFile, a drive that converts Macintosh files to MS-DOS format (see the review in January's "Product Reviews"). Equipment start-up costs

were close to \$10,000.

Cole's marketing efforts are a whirlwind of speaking engagements, teaching classes (at a local university and in-house at various corporations), and writing news-

paper columns (for the *Texas Women's News*). Infotek Systems takes projects from beginning design through the final printing and provides such related services as desktop-publishing training and consulting.

Cole belongs to an informal network of seven people in the Dallas area who provide each other with backup and support services. Cole often visits the Dallas Infomart, where electronic-publishing vendors run seminars and demonstrations.

Small orders from a local printer add up to about \$600 per month, and special orders can bring in as much as \$4,000 for a single project. As the business develops, Cole finds herself taking fewer and fewer small projects. Infotek will gross \$16,000 in its first year and projects \$30,000 for the second year.

DEAN SMITH: THE LASER PRINTER

While working toward his degree in physics at Harvey Mudd College in Southern California, Smith learned to use mainframes, minis, and micros. His computer experience led to his working in a desktop-publishing business set up in a spare bedroom at a friend's house. Smith spent six months working there and then developed his own business, The Laser Printer, in a downtown Davis, California, office.

Smith is one of four associates in a medical-marketing group with which The Laser Printer shares office space. The desktop-publishing service produces

sales-presentation materials for the marketing firm, and medical sales help the cash flow of the publishing business.

To date, Smith has invested about \$14,000 in his equipment. He uses a Macintosh Plus, *PageMaker*, an Apple LaserWriter, a copier, and some traditional pasteup tools.

While The Laser Printer's main client is the medical-marketing group, several other clients keep returning because of the quality work and service. Smith's portfolio is an excellent marketing tool.

Smith charges about \$45 an hour and expects to bring in approximately \$20,000 his first year, taking him past the break-even point. He expects to increase his gross income by at least 50 percent in the coming year.

ROSE ZALESKY: CANADIAN MUSEUM OF FLIGHT AND TRANSPORTATION

Just five miles north of the United States-Canadian border, Rose Zalesky and her husband live and work in their farmhouse on 24 acres near Whiterock, British Columbia, Canada. During the summer, the homestead becomes an outdoor museum with 39 vintage airplanes in various stages of restoration. (Readers who attended Expo '86 in Vancouver, B.C., saw four of the Zaleskys' airplanes on display.) The idea for a museum was formed in

1971 when Ed Zalesky began buying parts of old planes lying in farmers' fields. Eventually he was able to begin rebuilding the planes, and the museum took off.

Year-round the Zalesky home buzzes with the sounds of computers, printers, and a press busily working at both the museum's internal operations and the fledgling desktop-publishing operation. The desktop-publishing business was established in 1987 to join the gift-shop bookstore as part of the money-making arm of the nonprofit museum.

The museum's desktop-publishing

equipment includes nine computers and two printers; the main computer is a Kaypro 286i (an IBM AT compatible) with a 50MB hard-disk drive. The museum also has a 38-year old AB Dick 350 offset press, which is used to produce large print orders. The offset press was a secondhand purchase made in 1961. Total start-up cost for equipment was about \$25,000. For smaller print runs, the Za-

leskys use one of two copiers. They also have a Sharp fax machine. The main programs they use are *Ventura Publisher* and *WordStar*.

Rose, her family, and additional staff (six people contribute to the enterprise, including the Zaleskys' daughter, April, and son, Mark) produce a mail-order catalog of items from the museum's gift shop and a quarterly newsletter distributed to

museum members and visitors. They're also working on a special project—a book of interviews with 80 Canadian aviation pioneers.

Since the desktop-publishing business just started last November, it's too early to determine how much it will contribute to the museum's funds. As yet, the Zaleskys have no hourly rate but price jobs by the project.

MEET THE ESTABLISHED ENTREPRENEURS

MICHAEL GOSNEY: DONOVAN GOSNEY AGENCY AND VERBUM MAGAZINE

Michael Gosney's ad agency has been flourishing for 10 years, and it shares a home office with his new desktop-publishing magazine. His studio is a small building on the grounds of his San Diego, California, home. This arrangement separates his family life from his business life.

Gosney became a desktop-publishing enthusiast three years ago when he was experimenting with *MacPaint* to create books about graphics on the Macintosh. At that time Gosney added desktop publishing to the Donovan Gosney Agency, which combines traditional hand layout with computer-based design and illustration. In 1987, Gosney launched his own computer-graphics magazine, *Verbum*.

Gosney's studio equipment is varied and high-powered with a Mac Plus, Mac

SE, two Mac IIs, and a Super Mac 19-inch monitor. Hard-disk drives range from 20MB to 80MB. Gosney has two printers, an Apple LaserWriter Plus and a Hewlett-Packard PaintJet ink-jet printer, and a photocopier with a zoom lens that can enlarge and reduce images. When high-resolution printing is needed, Gosney uses an outside Linotronic service bureau. Software includes *PageMaker*, *Adobe Illustrator*, *Ready, Set, Go!*, *Image Studio*, *CricketDraw*, and *PixelPaint*.

Some of the agency's clients have desktop-publishing programs and laser printers, but rely on Gosney's firm for design and advertising expertise. Gosney delivers his work to them on disk, and, in some cases, the clients print their own camera-ready copy.

Specialized products include four-color brochures and logos produced with a 3-D program. In addition, Gosney offers desktop-publishing seminars to local trade-

school students because employers, ad agencies, and studios are looking to hire people with desktop-publishing expertise.

Gosney produces his own data and graphics work for *Verbum* magazine, which is being marketed to bookstores and computer stores. Apple Computer Inc. helped the effort by purchasing 1,000 copies of the first issue for distribution to its dealers. Circulation is expected to grow from 5,000 to 20,000 by the end of 1988. By that time the magazine will have outgrown his home studio.

Gosney has 3 full-time employees, plus a team of 10 freelancers for *Verbum* and another 8 freelancers for the Donovan Gosney agency. He points out that, thanks to desktop-publishing technology, he can run a "lean" operation and accomplish a great deal with a relatively small staff. Creative work is priced at \$60 per hour and production work at \$45 per hour. The agency grosses \$600,000 a year.

Verbum
1.3
JOURNAL
OF
PERSONAL
COMPUTER
AESTHETICS

HIGHER VISIONS, HIGHER RES
FIRST LADIES OF DIGITAL ART
April Greiman
Dominique de Bardonche Berghund
DESKTOP VIDEO

TOOLS OF THE REVOLUTION
Object-Oriented Programs Compared
ImageStudio and Cray-Scale Magic
First Contact: Adobe Illustrator
THE HOME MUSIC STUDIO

Verbum, Gosney's computer-graphics magazine.

1. "Night Café" Vincent van Gogh, 1888
2. "Persistence of Memory" Salvador Dalí, 1931
3. "Self-Portrait as a Recumbent" Giorgio de Chirico, 1913
4. "Guernica" Pablo Picasso, 1937
5. "Victor After the Banquet" Paul Gauguin, 1888 (right)

NIRA
Los Angeles artist Nira used MacPaint to produce "The Kiss."

HELEN ARCENEUX: WORDS & GRAPHICS

When her business became so successful it outgrew the spare bedroom and then took over the entire family room of her house, it was time for Helen Arceneux to move her company elsewhere. With five teenagers in the house, space was at a premium. So she moved to a nearby Dallas, Texas, shopping center where her business thrives.

Words & Graphics provides both word-processing and desktop-publishing services. Arceneux's software skills are self-taught, and computer expertise is provided by her husband, who is a computer consultant.

Arceneux's total business investment is around \$35,000. Hardware includes four IBMs, three Macintoshes, a modem, a scanner, and two copiers. Software includes *PageMaker* and *Microsoft Word*.

Most of Arceneux's clients run local businesses, although she does have a local client with an office in New York City



who receives documents there via modem. Arceneux gets a good deal of business through word-of-mouth referrals. She has recently done some business in tandem with a copy shop that has moved in next door.

On the production side, Words & Graphics has one full-time employee and two part-timers who work as needed. Arceneux's husband provides help with the technology, and her 18-year-old daughter, Laurie, works part-time. Her 17-year-old

son, Paul, is experimenting with keeping the store open on Saturday mornings for self-service customers. Even her 13-year-old son, Matthew, has produced graphics for a client.

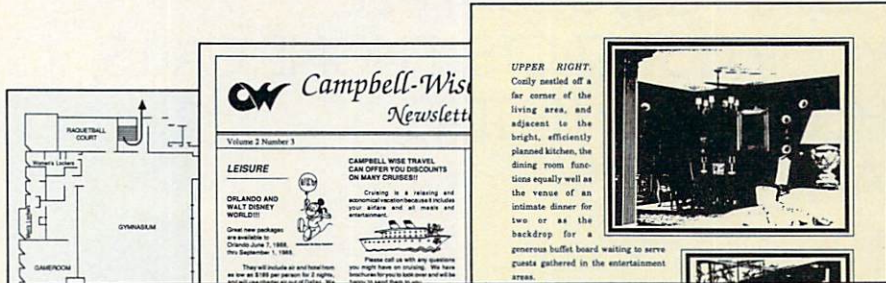
Arceneux prices projects at \$40-\$45 an hour, the going rate in the area. Words & Graphics earned a gross income of \$72,000 in 1987 and projects \$80,000-\$90,000 for next year. The highest monthly income to date has been \$11,000.

EMILY O'CONNOR: CENTERS COMPOSITION

The entire lower floor of Emily O'Connor's three-story house in Pine Bush, New York, is dedicated to her business. Centers Composition was launched in 1974 and is now the major source of income for the family.

O'Connor's many years of professional experience with advertising, graphic arts, lithography, photography, traditional typesetting, and commercial printing processes gave her the background to start her booming home business.

Because O'Connor was a pioneer, she paid a high price to acquire new technological equipment. She started with electronic-typesetting equipment that cost \$200,000 in the 1970s. A Radio Shack Model 2 computer system with its auxiliary equipment cost \$17,000 in 1979, and an IBM-compatible computer with a math co-processor chip and STB graphics board and an Apple II LaserWriter Plus cost



\$10,000. O'Connor also has three other computers she lends out to independent contractors.

O'Connor uses her Apple LaserWriter Plus printer and two 1200-baud modems for transferring data to and from independent contractors. This is especially important during winter when snows are heavy. For page-layout software, she uses 'Puter Group's *Pagewriter*, a custom program for typesetters similar to *Ventura Publisher*.

Centers Composition serves a number

of established clients, and O'Connor is also starting to publish her own books. The first will be a directory listing of about 10,000 businesses in Orange County, New York. Local independent contractors, including O'Connor's daughter-in-law, help with data entry, editing, graphics, and writing.

Proposals are based on a \$50 per hour rate, and net annual income averages \$40,000, with the yearly gross varying from \$75,000 to \$100,000. ■

DESKTOP. PUBLISHING BOOKS

The Aldus Guide to Basic Design.

by Roger C. Parker
Aldus Corporation
411 First Ave. South, Suite 200
Seattle, WA 98104
\$6.95 (softcover); free to registered *PageMaker* users

The Art of Desktop Publishing, second edition, by Tony Bove, Cheryl Rhodes, and Wes Thomas
Bantam Books
666 Fifth Ave.
New York, NY 10103
\$21.95 (softcover)

Desktop Publishing on the Macintosh, by Kevin Rardin
New American Library/Plume

120 Woodbine St.
Bergenfield, NJ 07621
\$22.95 (softcover)

The Illustrated Handbook of Desktop Publishing and Typesetting, by Michael L. Kleper

Tab Professional and Reference Books
Tab Books, Inc.
Blueridge Summit, PA 17214
\$49.95 (hardcover); \$29.95 (softcover)

PageMaker: Desktop Publishing on the IBM PC and Compatibles, by Kevin Strehlo
Professional Publishing Group-Scott, Foresman and Company
1900 East Lake Ave.
Glenview, IL 60025
\$21.95 (softcover)

Publishing from the Desktop, by John Seybold and Fritz Dressler

Bantam Computer Books
666 Fifth Ave.
New York, NY 10103
\$19.95 (softcover)

DESKTOP. PUBLISHING ORGANIZATIONS

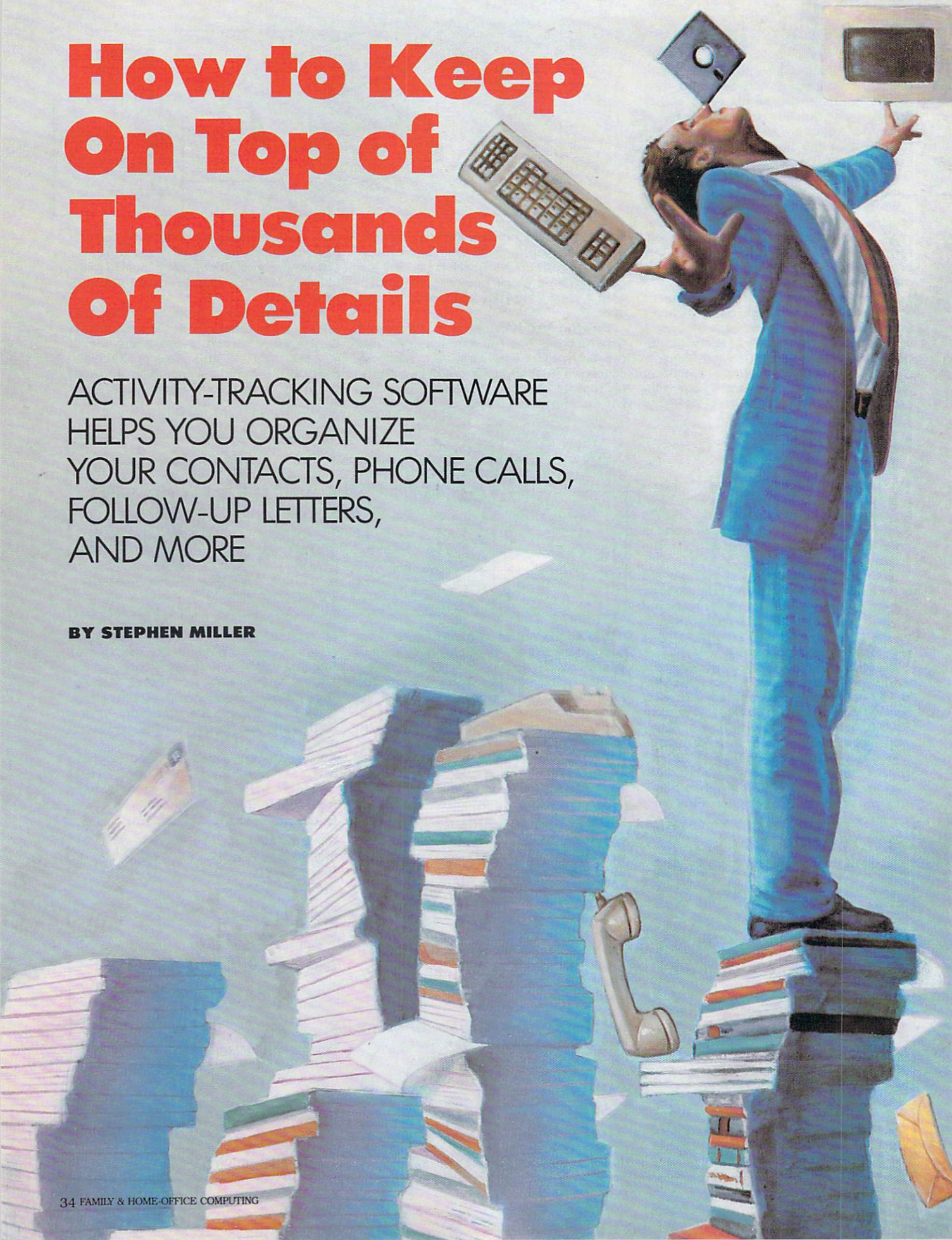
National Association of Desktop Publishers
P.O. Box 508
Kenmore Station
Boston, MA 02215
(617) 437-6472
Annual dues: \$95, U.S.; \$125, foreign

Newsletter Association
1401 Wilson Blvd., Suite 403
Arlington, VA 22209
(707) 527-2333
Annual dues: \$280

How to Keep On Top of Thousands Of Details

ACTIVITY-TRACKING SOFTWARE HELPS YOU ORGANIZE YOUR CONTACTS, PHONE CALLS, FOLLOW-UP LETTERS, AND MORE

BY STEPHEN MILLER



Mel Corbett spends most of his time on the telephone. The phone is the lifeline of New Horizons Management, his real-estate management/investment business—especially since he stays home and runs the business from an office in his Brooklyn apartment. Without the phone he couldn't find new clients for his building-management services or investors for the properties he and his partners, Bob Bridgers and Mark Hickson, find and develop. The phone also brings in problems for Corbett to solve: disputes between landlords and tenants, investors with cold feet, and contractors falling behind schedule. Keeping track of all that used to be a nightmare. "I'd have pieces of paper all over my desk reminding me of things to do and leads to follow up," said Corbett, "but notes would disappear or get buried at the bottom of the stack or I'd be so busy putting out fires that I couldn't properly prioritize things."

One of the first purchases New Horizons made was a computer, but at first it was used exclusively for word processing and spreadsheets. Corbett became fascinated with what the computer was capable of doing and started to investigate whether it could help keep track of his daily activity. He discovered a program called ACT! (activity control technology), which has made a big difference.

"By pressing one key, I can quickly see all the things I have to do. It keeps me from getting bogged down in side issues. Seeing everything organized in front of me helps me focus on the most important jobs," he emphasized.

Programs such as ACT! are part of a new trend in software that goes by various names: sales productivity, prospecting, lead tracking, or telemarketing programs (in this article, this type of application will be referred to as an activity tracker or just plain tracker). What it boils down to is a predesigned database that allows you to use the power of database software without learning to program. A database is a powerful tool because it allows you to manipulate information in ways either too time consuming or not possible by hand. For instance, alphabetizing a list of 500 names can be done in seconds with database software.

Although activity trackers were originally designed as sales tools, they are just as useful for various other tasks. Any business activity that depends on follow-ups or heavy telephone contact would undoubtedly benefit from an activity tracker. For example, while working on this article, I thought that if one of the programs could keep track of sales contacts, it should be able to keep track of my interview contacts. It proved so useful that I'm hooked, and my activity tracker is now almost as important as my word processor.

WHAT TO LOOK FOR IN AN ACTIVITY TRACKER

As a predesigned database, activity trackers can be key components in increasing your sales and better serving your customers. The programming has already been done, so all you need to do in type in the information that is unique to your business. Too many standard database packages are so powerful that you need better than average programming skills to get the most out of them.

All the activity trackers I examined have particular strengths and weaknesses. You have to choose the one that best suits your operating style, but based on comments made by users, a good one should have the following qualities:

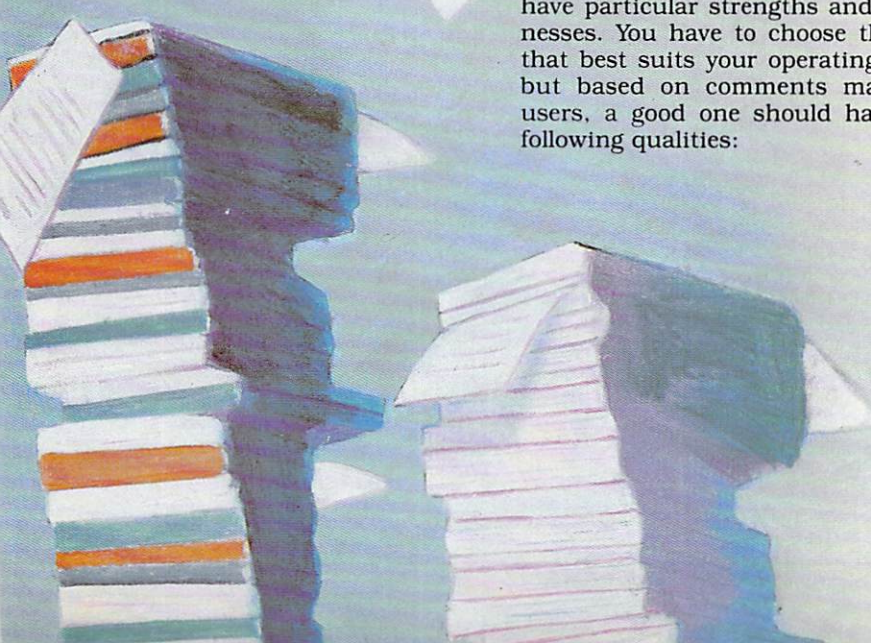
1. The program should allow you to retrieve information quickly with few keystrokes or commands.
2. It should be flexible enough for you to easily add unique information about your customers.
3. It should have a good tickler system to remind you of important tasks.
4. It should have word-processing capability for quickly entering notes or writing memos and short letters.
5. It should have either a library of standard letters or the capability to create your own.
6. It should allow you to send and receive (import and export) information from other database or mail-merge programs.
7. It should have either its own mail-merge system for mass mailings or at least be able to send the information to a word processor with that capability.
8. It should be able to print labels for that mailing.
9. It should generate detailed reports and have the ability to let you design your own.
10. It should automatically maintain a history of all your activity.
11. It should have an auto-dialer.

ACTIVITY TRACKERS IN ACTION

Douglas Giffin uses an activity tracker called *Follow Up* to organize the sale and brokerage of industrial spare parts (see *accompanying box for complete software descriptions*). He runs his business from an office in suburban Cleveland and says he would have difficulty doing it without the program. "When you're a one-man outfit, there are a lot of things to take care of. You're handling everything from marketing down to accounting. If you don't have a tool like this to keep track of things for you, you can't keep up," he commented. He flatly said that the program has made a significant difference in the organization of his activities and that it has increased his sales by 25 to 30 percent. He is now dependent on the system. "Everything that I do, every transaction, every customer contact, everything that I deal with, I put in the computer. If a bomb went off in the building, but I could take my computer along, I'd still have my business. That's no exaggeration," he said.

Don Aitken, of Time Systems in Toronto, Canada, trains people to better organize their business lives. The courses he teaches deal with

STEPHEN MILLER is a contributing editor for FAMILY & HOME-OFFICE COMPUTING.



time management and involve the use of notebooks and other printed reminders to keep track of to-do lists, appointments, and results of client calls. He feels that the foundation of personal organization is the management of information. "What your system (manual or electronic) should do is to easily create and maintain information on a variety of aspects of your business, so that the information is quickly found and acted upon." He continued, "An activity tracker handles all that with minimal effort on your part."

Frank Rimkus of Winthrop Securities, a Los Angeles area real-estate investment company, said that the organizational ability of his program, *Sales Ally*, allows him to be more professional for his clients. He can much more quickly retrieve information in order to answer customer questions. "We can access their files

and shrink the turnaround time from questions asked to questions answered. It makes our use of time much more efficient and makes us look better," he said. Rimkus can't prove it statistically, but it's clear to him that this level of service will "do some nice things for future sales."

For small businesses and salespeople, finding the time to both sell and manage the business is a serious problem. Don Plumley operates his consulting firm, SaleSolutions Inc., from his southern California office. His company helps other small businesses increase their sales. Plumley said that "most salespeople find that time management is very important. There are a limited number of hours in the day in which they can contact people." Plumley continued, "A sales-productivity package is a key component to time management"; he uses the *ACT!* activity tracker.

Tom Terry, an independent marketing consultant in the Napa, California, wine country, figures that his activity tracker, *C.A.T.*, saves him enough time to give him an additional month each year of "free" sales time. "I don't have to spend as much time doing routine tasks, and that gives me more time to look for new business," declared Terry. He said that the program allows him to do in hours what used to take several days.

Albert Robichaux is a modern manager. Even though he runs a small business, he operates it with the same management tools that a major corporation would. His business, which he took over when his father retired, is running Robichaux's Lafayette 76 Auto/Truck Plaza on Interstate 10, west of New Orleans. In less than two months, Robichaux increased the amount of fuel he was selling by 50 percent; one reason for

POPULAR ACTIVITY-TRACKING SOFTWARE

When looking for an activity tracker for your own work, you'll want to ask whether or not it has the following capabilities. The list of software that follows includes a concise description of each package.

- Can it be customized with unique user information, or are you limited to only the preset categories?
- Does it have a tickler system for calls, meetings, reports, and memos?
- How complete is its word-processing or notepad capability?
- Can it store stock letters or memos?
- Does it supply stock letters, let you write your own, or both?
- Can it import and export data from database or mail-merge programs?
- Can it do mail merge?
- Does it make labels?
- What kind of reports does it produce?
- Can customized reports be designed?
- Does it maintain a history of all activity with clients?
- Does it autodial the phone through your modem?

SOFTWARE LIST

ACT!

Conductor Software
(214) 929-4749
\$395

Requirements: 460K IBM PC

Version 1.10 is the standard by which all activity trackers should be judged. Easy to use, easy to customize, and very fast. Not just for salespeople. Any job that requires extensive phone contact and follow-up can be helped by *ACT!*. The ability to customize reports could be made easier, however, and although it has a pop-up calculator, some predefined calculation fields such as figuring discounts and sales totals would be nice. *ACT!* is also a memory hog. It needs 460K to operate, but since it does just about everything,

that isn't a real problem. My personal favorite.

CAN (Clients and Notes)

FENware Development
(414) 462-9026
\$50

Requirements: 512K IBM PC

Requires you to perform too many functions that should be automatic, such as assigning client numbers and forcing you to reindex when you delete a record. Limited note-taking capability. Biggest drawback is no on-screen generation of reports such as to-do lists and other tickler information: reports can only be printed or sent to a disk file. No autodialer. This is version 1.0 of *CAN*, and I believe it will improve in newer versions.

C.A.T.

Chang Labs
(408) 246-8020
\$400

Requirements: 512K Macintosh; 800K drive

An intricate but complete activity tracker whose name stands for *contacts*, *activities*, and *time*. Organizes all activities into six types—letters, orders, meetings, phone, facts, and general—and all can be customized to suit your work. For instance, if you're a freelance photographer instead of a salesperson, you might change "orders" to "sessions." Mailings are a particular *C.A.T.* strength: The program's structure makes it easy to send follow-up letters to clients or customers, as well as print mailing labels and do mail merge between your account list (or a selected section) and a letter or other document.

DayFlo TRACKER

Dayflo Software Corp.
(714) 474-1364

\$150

Requirements: 384K IBM PC (640K recommended); hard-disk drive

Although not the classic activity tracker (it's missing too many of the automatic functions), it does have the advantage of trying to simulate how many of us work—in a free-form fashion. This is for the person who operates more on the fly and needs some looseness in how details are organized. *DayFlo*, which is described as a word processor/database manager, allows you to stop and add database information without having to use the rigid structure of fields and records that most databases require. It allows you to retrieve the information in the same sort of free-form manner. Worth a look.

Personal DeskMate II/Professional DeskMate

Tandy Corporation
(817) 390-3011
\$100–\$150

Requirements: 256K Tandy 1000, 256K IBM PC

Tandy's integrated program, with six of the most popular applications, also has had a built-in scheduler/to-do/tickler component for several years. It has nearly all the functions you would want in an activity tracker, including an autodialer. The beauty of *DeskMate* and its subsequent upgrades is that any owner of a Tandy 1000 already has the program because it came free with the computer. The current versions—*Personal DeskMate II* and *Professional DeskMate*—are available as stand-alone products for any MS-DOS computer.

Follow Up

Xycad Group
(800) 428-8457
\$180

Requirements: 256K IBM PC

A major upgrade of this program was

that increase was his ability to contact and track potential customers.

According to Robichaux, before getting a computer he used to have trouble contacting his major customers to keep them up on new pricing information. Now, with a program for his Macintosh SE called C.A.T., he can contact at least 200 companies and several hundred more. He's added about 400 names to his customer list. "I'm taking the approach that the more someone hears from me, the more likely that person is going to do business with me," explained Robichaux. He said he wouldn't even attempt his new marketing strategy without the computer. A bonus for Robichaux is the change in his father's attitude. The elder Robichaux had resisted getting a computer because he didn't see how it could help them pump more gas. He's now a believer.

TICKLE YOUR MEMORY, AND LAUGH ALL THE WAY TO THE BANK

What day did you promise to deliver your product to your client in Seattle? Was it the 15th or 16th? When were you supposed to call the East Coast distributor about your back-order? Did you actually tell that customer that you would give them a 30 percent discount? If you sometimes get stuck for the answers to these questions either because you didn't write them down or can't find the note that was right there on your desk a minute ago, then an activity tracker can be of enormous help. Most of them have either note-taking capability or full-fledged word processors so that you can store information in a free-form fashion.

Don Plumley likes the fact that he's able to attach notes to document his phone conversations. "When you call

that person a month from now, this allows you to have a record of what you talked about," he said. And Doug Giffin uses notes to keep detailed information about a contact's wants and needs. "At the end of a week or two I output all this information and can organize it to follow-up," he said.

Another way these programs help you manage time is by reminding you of important tasks. Like many mothers, they won't let you get away with skipping those things you should but just don't feel like doing.

Jerry Jacobson, of Business Records and Consultants in Denver, admits that he sometimes avoids returning certain phone calls. But with his activity tracker, *Sales Ally*, the tickler function "almost forces you to call people back." Jacobson says once *Sales Ally* goes into its tickler mode, it simply brings up his scheduled calls on the screen and dials them

released shortly after I finished the research on this article. The version I reviewed had most of the standard functions, but it lacked its own word processor and an autodialer. It was also copy-protected. A word processor has been added, and it now autodialed if you have a Hayes-compatible modem. Best of all, the copy protection has been removed. *Follow Up* was developed specifically for salespeople, and that focus hasn't changed, so those are the users who will get the most out of it. For non-sales use, another package might be better.

The Front Office

Interactive Micro
(603) 938-2127
\$129

Requirements: 256K IBM PC (640K recommended)

The Front Office has most of the needed functions—such as a tickler, quick retrieval by your criteria, and autodial—but seems geared more toward a sales manager than a single salesperson (although the publisher says it can be used by sales reps, too). The version I reviewed lacked notepad or word processor, but they have been added with version 5.2. You can export files to major word-processing programs for mail merging. Heavy on financial record keeping, job costing, orders, and commission tracking. It's shareware, so you can try before you buy.

Inside Track II

I-Track Corporation
(214) 578-8104
\$100

Requirements: 256K IBM PC

This is the only memory-resident activity tracker I found. Not a bad idea if you have plenty of memory and spend most of your time working with another application, such as a spreadsheet. *Inside*

Track's big plus is that it not only lets you build your own database of information, but sells completed databases, *Inside Guides*, in a variety of areas. For example, the *Inside Fortune 500 Service Companies* disk gives names, addresses, phone numbers, and the top two officers of those 500 companies. This can save you a lot of work looking up this information. *Inside Track II* also has a group of databases on major U.S. cities; everything from restaurants to tourist attractions with pertinent information such as whether reservations are necessary. My only concern about the *Inside Guides* is whether the information is as current as it could be.

Market Master

Breakthrough Productions
(619) 281-6174
\$295

Requirements: 1MB Macintosh; hard-disk drive

Particularly suited for salespeople tracking sales leads, sending follow-up letters. Gives you a step-by-step structure for dealing with any individual lead. For instance, you can set up several different automated response letters to any sales lead—one if they say "yes, we're interested," one if they say "no, we're not," one if you get no reply at all, and a fourth if they actually buy your product or service. Allows you to code the source of any sales lead.

Prospecting Plus

Key Systems, Inc.
(800) 223-5637
\$495

Requirements: 384K IBM PC; hard-disk drive or two 720K drives

This program has most of the functions we've outlined, yet it hasn't kept up with the times. We reviewed version 7.0, but it has the feel of an old CPM program (the

most popular operating system before MS-DOS took over)—and that isn't quite good enough anymore. The program is menu driven, but it uses numbers as menu choices rather than the current convention of using the first letter of the menu choice as the command. One strength is bulk mailings; it will even tell you how much postage you need. However, it also is one of the slowest of the programs when doing sorts and searches.

Sales Ally

Scherrer Resources, Inc.
(215) 242-8751
\$395

Requirements: 256K IBM PC

One of the heavyweights. Has nearly all the features you would want. Easy to use and easy to customize. Can be set up for multiple users with separate passwords and privilege levels. Screen display of reports, to-do lists, and most other functions. Contains an autodialer and an excellent notepad and word processor for mail merge. Great linking feature for relating referrals to each other.

TeleMagic

Remote Control
(800) 992-9952
\$295

Requirements: 512K IBM PC

This is a really top-notch activity tracker. There is little that it can't do. It's complete, fast, and has lots of options for customization. Despite all this power, the basics of *TeleMagic* are quite easy to learn. Since the program was designed as a tool for telemarketers, the support for the telephone is the best of all the programs. It can handle three lines and PBX; it supports music on hold and offers other razzle-dazzle phone tricks. If you really have to work the phones, this is the program for you.

automatically. He said that the program allows him to get right to his callbacks first thing in the morning, and he's found that the routine gets them out of the way and allows him time to investigate new leads.

Don Aitken stresses that time management is more than making to-do lists, but that having such lists helps you to focus your attention on those tasks that need to be completed. One feature of activity trackers is the ability to automatically generate to-do lists. ACT!, the program that Aitken uses, divides your activities into three parts: calls, meetings, and to-dos. You can either print out the list or pop it up on-screen at the touch of a function key. Other tracking programs work in a similar manner.

Plumley said that "everybody makes to-dos, but with a paper list it's very easy to put things off. When the computer beeps at you and tells you that you are supposed to call someone right now, it's hard to ignore." He believes that the goals you set for yourself are more often met if you're prompted by the computer. He said that the program makes him more productive because "it keeps me more honest with myself."

MAILING TO ONE PERSON OR ONE THOUSAND

Quickly and effortlessly sending letters or memos and pulling together mass mailings with mail merge are two more features to look for in a tracker's word-processing function. Many of the programs have a feature that indicates if a particular person should get some correspondence and exactly which piece of information is to be expected.

Jerry Jacobson in Denver likes to send thank-you notes to all his hot prospects, but the process could get tedious. In the past, he would write out the various notes and give them to his secretary to type. After proofing them and making changes, they were finally typed on letterhead, signed, stuffed in an envelope with literature and a business card, and mailed. Repeating that process 10 or 15 times was time-consuming for both him and his secretary.

"I have about a hundred canned letters," he commented. "I insert a little code telling which letter to send. When I'm done with all my calls, I just go to the program's print functions, and it prints up every one of them. I don't have to write all the letters out, and I don't have to wait to get a dozen letters back from my secretary and proof them three times. It's all done

right there and I just slap in a card with a little literature and off it goes." Jacobson said this now frees up his secretary for other duties.

The mass-mail function of tracking programs is also of enormous value to a home-based business. Doug Giffin is about to send out a mailing to 2,500 prospects. "It's now simple. I'm just going to run a printer for a couple of hours, and it will print out individual letters to all these people," he said. Giffin contended that if he had to do it manually ("I'm not a great typist"), it could take a couple of days. He could hire someone to do it in about the same amount of time, but there would be the added expense. With *Follow Up*, his activity tracker, he can do it all himself, saving both time and money.

ANY BUSINESS ACTIVITY THAT DEPENDS ON FOLLOW-UPS OR HEAVY TELEPHONE CONTACT WOULD BENEFIT FROM AN ACTIVITY TRACKER.

The Dallas-based Exhibit Store, which sells and rents out trade-show booths, originally used an outside service for its mass mailings. The service took care of the actual mailing, but it did not maintain the list. The Exhibit Store personnel had to keep the list up-to-date and pay for the mailing service. One of their salesmen, Rik Kent, discovered an activity tracker called *The Front Office* that has allowed The Exhibit Store to do the mailings in-house. "It makes it a little easier for us and a whole lot more accurate," Kent said. While unstated, he implied that his company was also saving money by not having to pay an outside service.

Jacobson commented that he wasn't able to do mass marketing and mailings before acquiring *Sales Ally*. "We had never been able to do that before," he said. "We just didn't have the ability to regularly target selected groups and send them personalized letters."

ANALYZING YOUR BUSINESS WITH REPORTS

Reports: the bane of everyone's existence, but crucial to understanding how your business operates. Someone is always asking for an analysis

of how an aspect of the business is doing. Your accountant needs you to report on your tax-deductible expenses. A client wants a detailed breakdown on what you have been doing to justify your recent invoice. The manufacturer you represent wants to know the disposition of the 200 leads he sent you last week. The right activity tracker can drastically reduce the time it takes to compile such reports.

Jerry Jacobson said that lead reporting once was his worst nightmare. "I used to have to sit down and fill out all these forms that they'd [the manufacturers] send me, make copies, and send forms back to them. Now I just put in a code [in the program] that the lead was from a particular manufacturer. When it is time for a report, I can just print out a report based on those leads already sorted by manufacturer. That eliminates hours of work."

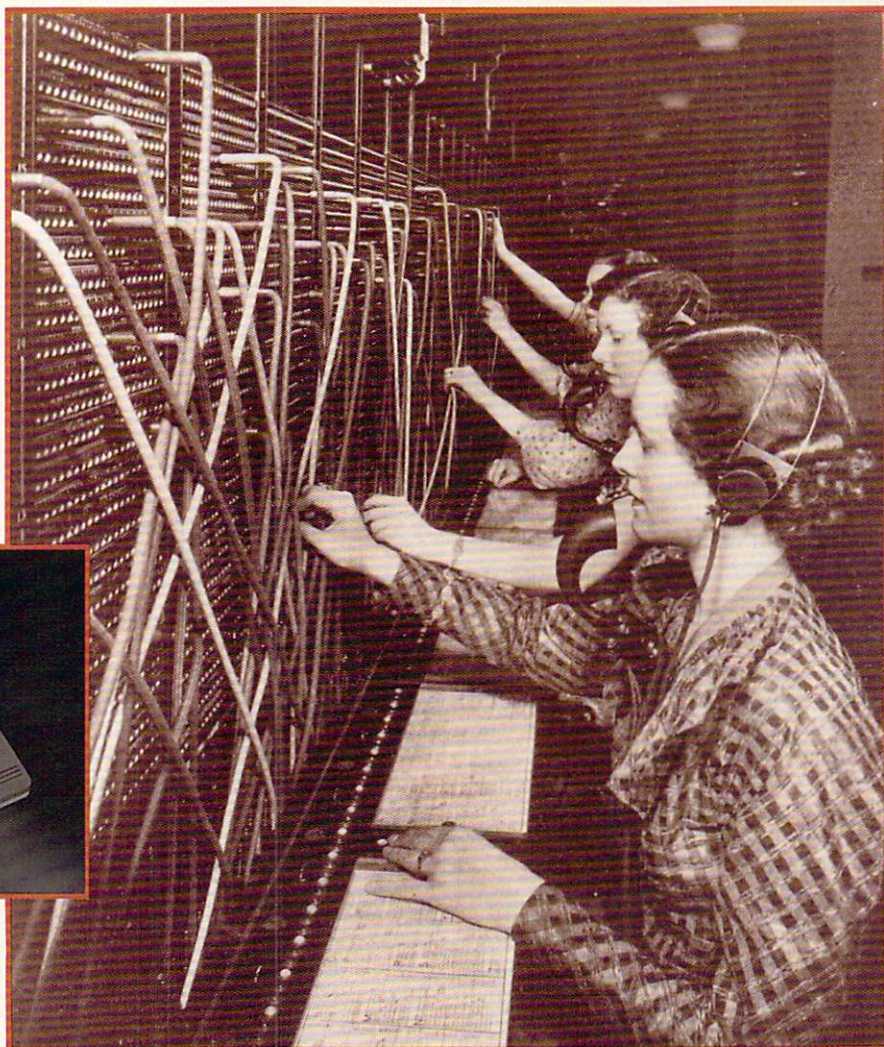
J. Bryant Green, a vice president in the commercial loan department of the United State Bank in Cedar Rapids, Iowa, uses a program called *Inside Track II* to make sure that a number of critical reports are filed on time. Some forms are required filings by regulatory agencies, and others affect interest paid or earned. He explained, "We have to track 40 or 50 different types of documents that have different maturity dates." Making bad loans isn't the only way a bank can lose money. Another way is not filing timely reports to the government or making certain payments on time. Green says *Inside Track II* helps him and other bank employees generate the proper reports at the proper time and thus saves the bank from paying fines or late fees.

Don Aitken believes that activity-tracking software is valuable because it helps manage your time, especially when you have limited staff resources. "Most people spend a significant portion of their day managing the details and commitments that come from their contacts and communications," he stated, "and the key to all of this is managing the information."

Aitken knows that everybody still has the same 24 hours in a day, but some people will do more with it. Using a computer and the proper software can allow you to use that finite amount of time better than your competition does. If you manage your time better, the chances are you'll do better; your business will grow, and that, after all, is why you started it in the first place. ■

Setting Up a Professional Telephone System

HOW TO MAKE YOUR HOME-OFFICE PHONE SYSTEM SOUND LIKE THAT OF A BIG COMPANY



"You've come a long way, baby." An AT&T switchboard in 1937, and its new cordless 5310 in 1988.

Tasks that not too many years ago required the services of a full-time office receptionist armed with a complex, multiline telephone system, now can be effectively accomplished in a home office on a reasonable budget. New full-function touch-tone phones, portable phones, fax machines, various electronic services offered by local phone companies, and even computer add-on boards enable individuals to customize their phone systems. Even more important, these new products and features let home-office and small-business users set up a phone system that makes them sound professional.

The problem, of course, is how to make a home-office phone system sound like that of a large company; how to provide what business callers

want to hear when they call any office. The first thing business callers want to hear is a ringing phone. Busy signals are turnoffs. The second is a confident, knowledgeable voice—within a few rings. Four-year-olds are cute, but they know nothing about business. Unanswered phones are annoying and waste people's time.

MULTILINE SOLUTION

The first issue to tackle is the number of separate phone lines needed to fulfill the needs of both the office and the home. Family members' personal calls and office business calls often create logjams and complicate the answering dialogue if only one line is

used. Facsimile (fax) machines and modems cannot be interrupted during operation and often tie up the phone lines for minutes or even hours at a stretch.

Most home-office people agree it is necessary to have at least two separate lines, which can be deployed in numerous ways. One line can be a business number, the other a residential number. You can list one number for incoming calls and use the second line for outgoing calls, or fax/modem calls, so that one line is always free. You can make all business calls on one line, so that you have a clear record of expenses from your phone bill. You can give voice

TIM HAZEN, a Connecticut-based writer, is adding a second phone line to his home office.

callers one number, and fax/modem callers the second. You can ask the phone company to install the second line as a "hunt" line, so that when the main line is busy, the phone call "hunts" the second line and the caller doesn't get a busy signal. Whatever setup you choose, make sure it's one that outsiders will understand and you will stick by, so as not to confuse people.

Paul and Sarah Edwards, home-based authors and marketing consultants in Santa Monica, California, have three different lines. One line is designated as the office phone and is used primarily for incoming calls. Another is the home phone line. The third line is solely for outgoing calls billable to clients.

The Edwardses have a modem and a fax machine, both of which are used only on the two lines used primarily for outgoing calls. "Distinguishing between the incoming and outgoing lines minimizes the number of times clients reach a busy signal," says Paul. "The fax machine is not kept on continual standby." That leads to another point: If you have a fax machine or modem, people should know whether it will be available all the time or whether they have to alert you in advance.

Joe Foster, an account executive at California's Pacific Bell, offers one caution about adding multiple phone lines to a residence. "Determine how many lines actually come into your home. If only one exists, extensive efforts, perhaps even trenching in some urban areas, might be necessary before you can have another line," he says. On the other hand, many homes with only one existing line have what is called "twisted pair wiring." With twisted pair wiring, one line can be electronically turned into two lines without physical work.

Before you install multiple lines, consider the cost attributed to lines designated for business. The advantage to paying a business rate is that you can get a listing in the Yellow Pages.

PHONE FEATURES

When you are deciding how many lines you need, you should investigate the growing number of features offered by telephone companies. People with standard touch-tone phones can use push-button codes to activate such features as conferencing, call waiting, or call forwarding. (See "Phone-Company Features.") Alternatively, these features can be added through the phone itself, even if the local phone company does not offer

them. It's worthwhile to call your local phone company and the long-distance service provider for details.

Call Waiting. Two of the most popular phone options for home-office users are call waiting and call forwarding. Call waiting keeps an outside caller from reaching a busy signal, even when the phone is being used. The phone owner hears a tone when a second call is coming through, puts the first caller on hold (by holding down the receiver button for half a second), and answers the second call. Another tap returns the owner to the first caller.

Mark Kindley, a writer living in New York City, said he could not

THE SECRET IS TO FIGURE OUT HOW YOU WORK AND DESIGN A PHONE SYSTEM AROUND YOUR NEEDS.

function without call waiting. "I often have long phone interviews while I'm also waiting for an important return call," Kindley says. "The brief interruption of my original call is worth it to at least be able to speak to the other caller, particularly if it's an international call."

Even people with two phone lines might want call waiting, especially if one line is tied up for hours on end with a modem or fax phone.

Call Forwarding. Call forwarding allows a businessperson's calls to be transmitted to wherever he or she is. Once you enter a code into the office phone, calls are automatically forwarded to any other phone inside or outside the office. This feature costs about \$15 to install and runs about \$2 per month. Call forwarding is especially useful during vacations or business trips.

ANSWERING SERVICE—OR ANSWERING MACHINE?

If you're not home or not able to pick up the phone, who or what does? After all, when people call an office they want to be able to leave a message that will be delivered intact to the addressee.

Controversy exists over the relative merits of the two main methods of answering the business phone when no one is in attendance: either by a traditional outside answering service or by an in-home answering ma-

chine. The Edwardses chose to use a machine. "A machine is ideal if the phone is likely to be answered normally during business hours," said Paul. "An answering service is expensive, but could be used during business hours—when clients expect to hear a live voice—if you're away from the phone a lot." Others say that even the so-called "best" answering services can be unreliable, sometimes letting the phone ring 20 or more times before answering it.

Kindley prefers a machine: "I would rather get an answering machine than a service. Services are often rude and rarely knowledgeable." But, he counsels owners to invest in equipment that allows such remote activities as message checking and message changing.

Dennis Foster, a banking consultant and president of the Foster, Puhl & Collins consulting firm, is often away from his Ft. Lauderdale, Florida, home office at other job locations for days at a time. He prefers an answering service. "In my business I'm very concerned about projecting a professional image," says Foster. "When bank CEOs call, I want to provide them that personal touch. A service takes the place of additional staff, and it offers an interactive aspect that a machine does not. I have the option of leaving messages for specific individuals, plus the service screens out unwanted calls."

One admonition offered by several answering-machine users is that the message callers receive is a factor in sounding professional. The consensus is that attempts at humor or cleverness usually spoil an otherwise professional image. Probably the wisest course is, as Sergeant Joe Friday would say, "Just the facts."

VOICE MAIL

A new personal computer add-on is providing an alternative to the answering service and machine. Called a Watson VIS Combo (see "Voice Mail," this issue's *Telecomputing* article), it acts as a computer-based voice-mail system.

The Watson VIS (voice information system) can be configured in various ways: as a message center, with codes for specific callers to pick up and leave personalized messages, and as an answering machine, equipped with special features. California writer and consumer-electronics expert Ken Joy uses a Watson board as an answering machine. "I can leave a message that says: 'if you are returning my call, push #1; if you wish to leave a message, push #2, and so

on," says Joy. "Then if I have a personal message for a specific person, I say: 'dial the last four digits of your phone number for messages'."

Joy says the Watson VIS message-forwarding function will even call him at a remote phone with important messages if he is not in the office. "Since I added this device, people tell me they think they're calling a company the size of IBM," he said.

THE PHONE ITSELF

Selecting the right phone from the dizzying array available is not easy. Important factors to consider include the number of phones needed; the number of lines each should be hooked up to; the quality of the sound; and the requirements for in-office mobility, conferencing, or any other special features.

Checking with local and long-distance carriers to see what features are available is an essential first step. For example, if phone conferencing is needed, but is not offered by the local phone company, then equipment capable of providing the service has to be purchased.

One phone feature that is handy in a home office is a "mute" button; press this button and no sound comes through from your end. Such background noises as crying babies, barking dogs, and rattling printers are blocked out.

Some home offices employ multi-line phones, and others opt for separate lines on different phones. Paul and Sarah Edwards have taken the latter route and have purchased five

cordless telephones to allow them to move about their homes at will. Others have purchased cordless phones so they could receive business-related calls while sunning in their backyards. The common complaint about some cordless equipment has been the poor sound quality, but users say the problem is disappearing.

Of all his phones, Paul likes his Canon Faxphone Model 10 the best. "It's got every feature I could want: a screen showing the number dialed, automatic redial, and a program feature for frequently dialed numbers," he says.

Indeed, fax machines are rapidly becoming a necessity for many small

"SINCE I ADDED A VOICE INFORMATION SYSTEM, PEOPLE THINK THEY'RE CALLING A COMPANY THE SIZE OF IBM."

businesses. Vian Mileham, a market manager for AT&T, says, "More and more you hear people ending a phone conversation with 'Give me your fax number, and I'll send you the report.' For PC-based businesses, a built-in fax board and a scanner might be the way to go." With a fax board installed on a computer, the user can send a computer file to a remote fax machine. Alternatively, a fax machine

that also includes a telephone and personal copier is a versatile piece of equipment for any office.

Headsets and speakerphones for those who take notes directly on the computer and want to avoid crooked necks are options to investigate. Even the simple rubber neck-cradles that stick to the phone handset can help ease neck strain.

800 READY LINE

Though many home-based businesses are not concerned with out-of-state or out-of-local-dialing-area business, those that are have several options open to them, depending on their long-distance carriers. Again, the home-business operator is well-advised to check with long distance carriers for available features.

For example, the addition of an incoming "800 number" is one way to add a professional touch to a home-office system. According to AT&T's Mileham, the company is now offering a WATS service that allows "800" calls to come into an established business-phone line. This service, called 800 READY LINE, resembles any other 800 service, so that callers have no idea they are calling a residence. No extra line is needed, and the setup cost is only \$15. "800 READY LINE service is simple, inexpensive, and only takes five days to set up," Mileham says. "The flexibility is great for small businesses because they can use it seasonally and sign up for specific area codes."

AT&T customers can also sign up for a "Call Me" card, which acts as a phone calling card, with the restriction that only one number may be called using the card. "A business could include the Call Me card number in an advertisement, and customers could call the business directly without incurring long-distance charges," says Mileham.

BE CONSISTENT

Having all of the phone-system features and equipment in the world will not necessarily keep 4-year-olds from answering business calls, nor will it guarantee that all business callers will think they're reaching a business the size of IBM. But setting up a phone system that sounds professional is possible, without spending thousands on an office-style system. The secret is to figure out how you work and design a phone system around your needs. Then stick to the protocol, so that outside callers won't be confused by busy signals, high-pitched data communications signals, or unanswered phones. ■

PHONE-COMPANY FEATURES

Following is a potpourri of features offered to business and/or residential phone subscribers by some phone companies. Various options may not be offered in some areas. These features are accessible to owners of a standard touch-tone phone. They are electronically installed by the phone company and then activated by pushing a short touch-tone code.

In areas where such service is not available, you may be able to add some features by buying the right phone.

Busy Call Forwarding: Automatically forwards incoming calls to any other phone number when the targeted line is busy.

Call Forwarding: Automatically forwards incoming calls to any other phone number.

Call Hold: Lets the user place a caller on hold.

Call Pickup: Permits subscribers who have more than one line to answer calls to any other phone at the business location.

Call Selection: Puts boundaries on calls made from certain phones. Any attempt to

call outside these preselected boundaries is automatically refused.

Call Transfer: Useful for relaying calls to other phone lines in the business.

Cancel Call Waiting: Allows the user to temporarily disconnect Call Waiting to avoid being interrupted during certain calls. A great benefit to fax and modem users, since an interruption usually disconnects the call.

Conferencing: Permits a third party to join an ongoing phone conversation without the help of an operator.

Delayed Call Forwarding: Lets the phone ring a specified number of times before forwarding the call.

Direct Connection: Instantly connects a caller with a preselected number without even dialing the phone. Although no outgoing calls can be made on this line, incoming calls may be received.

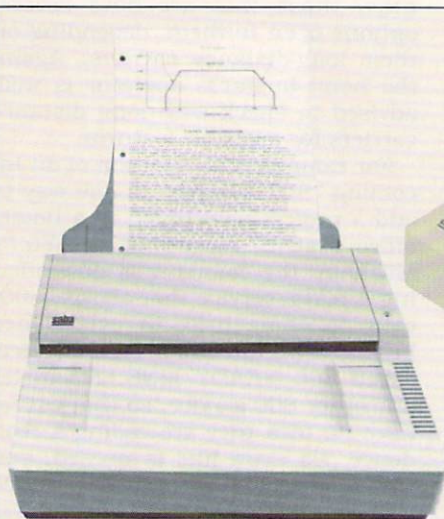
Intercom: Enables subscribers to use a telephone as a business intercom.

Speed Calling: Allows up to 30 frequently called numbers to be dialed by a one- or two-digit prerecorded code.

BUYER'S GUIDE TO SCANNERS

BY ROGER HART

INCORPORATE PRINTED TEXT AND GRAPHICS INTO YOUR DESKTOP-PUBLISHING, GRAPHICS, OR WORD-PROCESSING PROGRAMS



Saba Page Reader: a sheetfed scanner



Microtek MSF-300C: a flatbed scanner



Saba Handscan: a hand-held scanner

It's easy enough to get text and graphics out of your computer. Just attach a dot-matrix printer, and—zip—they come.

But what if you want to reverse the process? What if you want to store text and graphics in your computer? Almost everybody has printed material that would be better off inside the computer, where it can be filed and retrieved and duplicated. But typing it all in is a chore. And pictures can't be typed! Desktop publishers want to include more artwork in their newsletters; other business users may want to include random notes, memos, and graphs in reports they're preparing. Real-estate agents could keep a computerized photo of a house along with pertinent sales data. Model and talent agencies could have digital pictures of their clients. (Several database programs can now accept graphics.)

Scanners, whose operations are similar to those of copiers, allow you to "read" text and graphics into your computer—automatically. Scanners—until recently, expensive propositions—are becoming quite affordable and popular. Inexpensive hand-held scanners sell for less than \$300, and the inexpensive, more sophisticated models of flatbed scanners range from \$1,500 to \$2,000.

Scanners are becoming popular because of the widespread interest in desktop publishing. The smooth integration of text and graphics afforded by page-layout programs has brought about an increased awareness of graphics. Since few of us are expert computer artists, we

either buy predrawn artwork (clip art) on disk or use a scanner to input the graphics that we want to use.

Technical refinements have also helped bring scanners into the mainstream. For example, the software that comes with scanners is designed to store graphics files in standardized formats that can be used by other programs. At the same time, more and more new applications software is being designed to accept a wider variety of file formats.

Scanning text is not nearly as easy as scanning a graphics image, but it is possible with Optical Character Recognition (OCR) software. (See "Teach Your Computer to Read.")

Finally, all the scanners listed in our chart produce black-and-white or shaded "gray-scale" images. None can produce color images on-screen.

THE SNAPSHOT

Scanning requires a combination of hardware and software. And, because scanned images take up a lot of memory, a hard-disk drive is a virtual necessity. Scanners connect to MS-DOS computers through a serial port or by means of an add-in card; to Apple IIs by means of an add-in card; and to Macintoshes usually through the serial port or SCSI connector. In addition, some scanners are printer add-ons (see below) and not directly connected to the computer.

Most scanners "see" or "read" in similar fashion. A tiny light shines a dot across the page, and a light detector decides whether the spot illuminated by the dot is white or black. The detector then sends out an electrical signal

Contributing editor ROGER HART wrote "Paper Can Make or Break Your Image" in the April issue.

that is translated into a dot on your computer screen.

From this process, your computer gets a "data map" showing a page that is composed of black and white dots. Software supplied with the scanner controls its operation and generally offers several format options for saving the graphics file (described later).

WHICH TYPE IS RIGHT FOR YOU?

Though scanners all operate in the same basic fashion, they differ in mechanical design. For example, sheetfed models scan a flat sheet of paper or a photograph as it moves across the glass.

Flatbed scanners operate like many office copiers do. The work to be scanned is laid facedown on the glass plate, the cover is closed, and the scanning begins.

Hand-held scanners, which generally sell for less than \$300, are designed for scanning small sections of text and graphics, such as memos, address labels, and random paragraphs or photographs from books. Some have rollers to help you move the scanner across a page.

Less conventional scanners use your dot-matrix printer to move the scanner's "eye" across the page. They sell for less than \$300 and scan graphics only (no text). A special scanner head replaces the ribbon cartridge. Just pop out the ribbon, insert the scanner head, roll in the original, and the computer's scanner software runs the printer back and forth to do the actual scanning.

Which type is better? That depends. Sheetfed models can't take a graphic from a book, for example. Flatbed scanners, which function like standard office copiers, will. It can be difficult to achieve steady, clean scans from large pieces using a hand-held scanner.

IMAGE QUALITY

The resolution—or sharpness—of a printer is measured by the number of dots that are printed in a specific area. For example, many dot-matrix printers today will print 200 or so dots per inch. Laser printers are even better. They print with extremely fine dots, 300 to the inch. That crams 90,000 dots in a square inch!

Since scanners are, in essence, reverse printers, they have a resolution, too. As with printers, the higher the resolution, or the more dots per inch, the better the image.

The more expensive scanners read 300 dots in each inch, a resolution equivalent to that of a laser printer.

That's a sharp image, but it takes a lot of disk-storage space. A full-page scan at 300 dots per inch (dpi) will take 900K of disk space and will almost always necessitate using a hard disk.

Some scanner software will compress the data to keep the memory requirements lower. If your system has less than 640K (or 1MB on a Macintosh), make sure that the scanner software offers a data-compression option. In addition, most scanners can capture graphic images at lower resolutions, to save disk space.

CONTROLLING THE IMAGE

There are three basic ways to scan an image: binary, dithered, and gray scale. Most scanner software allows you to choose the way you want to scan.

Binary images are made up of black and white dots, and that's just how they print out. When you look at scanned photographs, you'll see that binary images are the grainiest in appearance. But the images from simple line art are usually pretty clean, because every part of a line drawing is either black or white.

Photos are continuous-tone images, made up of varying shades of gray, but rarely with sharp black or white breaks. If you took an average photo and described each tiny portion as either all black or all white, it would look pretty mottled and splotchy. And the contrast would be very high. In short, it wouldn't be a very true representation of the photo.

The way to improve the image is via a process called *dithering*, or computer halftoning. This technique takes groups of dots, figures their average "grayness" from the ratio of black to white dots, and leaves a square of gray. The best image will come from a very high-resolution scan, giving you more dots with which to work.

An even more precise method is gray scaling. Each individual dot—rather than a general area—is assigned a shade of gray. But, memory requirements rise dramatically because each dot must be described in greater detail.

USING SCANNED IMAGES IN APPLICATION SOFTWARE

The software that comes with most scanners will let you manipulate the scanned image in some fashion. You can generally change the borders or scan area, control the contrast and brightness, and set the quality by speci-



From photo to printout: The original photograph (left) was scanned into *PC Paintbrush* (center) using the Saba Page Reader. It was then printed (right) using the Hewlett-Packard DeskJet.



SCANNERS FOR LESS THAN \$2,000

FLATBED	Computer	Price	Resolution	Interface	Type	Software	Options	Warranty	Number of Fonts
AST TurboScan FB	M	\$1,899	300	Serial	OCR, Graph	G	None	90 days	N/A
AST TurboScan FB	I	\$1,995	300	Card	OCR, Graph	G	OCR software	90 days	50
Datacopy Model 730	I	\$1,800	300	Card	OCR, Graph	N	Auto doc feed OCR and graph software Interface kit	90 days	19 T
Datacopy Model 730	M	\$1,800	300	SCSI	OCR, Graph	N	Auto doc feed OCR and graph software Interface kit	90 days	21 T
Hewlett-Packard ScanJet	I	\$1,495	600	Card	OCR, Graph	G	OCR software Auto doc feed Interface kit	1 year carry in, 90 days on site	19
Microtek MSF-300C	I	\$1,795	300	Card	OCR, Graph	G	OCR software	6 months	250
Microtek MSF-300C	M	\$1,695	300	Serial	OCR, Graph	G	OCR software SCSI interface	6 months	20
Panasonic FX-RS505	I	\$1,495	400	Card	OCR, Graph	Y	Auto doc feed	1 year	16 T
SHEETFED	Computer	Price	Resolution	Interface	Type	Software	Options	Warranty	Number of Fonts
AST TurboScan SF	I	\$1,795	300	Card	OCR, Graph	G	OCR software	90 days	50
AST TurboScan SF	M	\$1,699	300	Serial	OCR, Graph	G	None	90 days	50
Abaton Scan 300/SF ¹	M ²	\$1,895	300	SCSI	OCR, Graph	G	OCR software	90 days	50
Canon IX-12	I	\$945	300	Card	OCR, Graph	N	Graphics software Training software Interface kit	1 year	N/A
Datacopy JetReader	I	\$1,300	300	Card	OCR, Graph	N	Auto doc feed OCR and graph software Interface kit	90 days	19 T
Datacopy JetReader	M	\$1,300	300	SCSI	OCR, Graph	N	Auto doc feed OCR and graph software Interface kit	90 days	21 T
Laser Optical Technology Image Scanner	M	\$1,785	300	SCSI	OCR, Graph	G	OCR software	90 days	T
Microtek MS-300C	I	\$1,795	300	Card	OCR, Graph	G	OCR software	6 months	250
Microtek MS-300C	M	\$1,695	300	Serial	OCR, Graph	G	OCR software SCSI interface	6 months	20
Princeton LS-300	I	\$1,095	300	Card	OCR, Graph	G	OCR software	1 year	15 T
Princeton MacScan	M	\$1,547	300	SCSI	Graph	Y	None	1 year	N/A
Saba Page Reader	I	\$1,299	200	Card	OCR, Graph	Y	None	90 days	70
Taxan Crystal Scan 300I	I	\$1,695	300	Card	OCR, Graph	G	OCR software	1 year	250
Taxan Crystal Scan 300MAC	M	\$1,595	300	SCSI	Graph	Y	None	1 year	N/A
HAND-HELD	Computer	Price	Resolution	Interface	Type	Software	Warranty	Number of Fonts	
Complete PC Hand Scanner	I	\$250	200	Card	Graph	Y	90 days	N/A	
Diamond Handy Scanner HS-1000	I	\$250	200	Card	Graph	Y	1 year	N/A	
Packard Bell Pocket Scanner	I	\$295	300	Card	Graph	Y	1 year	N/A	
Saba Handscan	I	\$799	N/A	Card	OCR	Y	1 year	35	
PRINTER-RUN	Computer	Price	Resolution	Interface	Type	Software	Options	Warranty	Printer
Epson 7392W	I	\$300	180	Serial	Graph	Y	None	1 year	LQ2500
Epson 8392W	I	\$300	144	Serial	Graph	Y	None	1 year	EX800, 1000
ThunderScan for Apple II	A	\$219	350	Serial or Game Port	Graph	Y	None	90 days	ImageWriter I, ImageWriter II
ThunderScan for Macintosh	M	\$250	300	Serial	Graph	Y	Power Access for MAC II	90 days	ImageWriter I, ImageWriter II

KEY: A = Apple II series; I = IBM PC and compatibles; M = Macintosh; G = Graphics software only; Graph = scans images into graphics programs; N = no; N/A = None applicable; OCR = scans text into a word processor; T = Trainable (you can train the software to recognize new fonts); Y = yes;

¹ Also available in a flatbed model; ² Also available for the IBM PC and compatibles for \$2,195

MANUFACTURERS

AST RESEARCH, 2121 Alton Ave., Irvine, CA 92714, (714) 863-9991; ABATON TECHNOLOGY CORP., 48431 Milmont Dr., Fremont, CA 94538, (415) 483-2226; CANON USA, One Canon Plaza, Lake Success, NY 11042, (516) 488-6700; COMPLETE PC, 521 Cottonwood Dr., Milpitas, CA 95035, (408) 434-0145; DATACOPY CORP., 1215 Terra Bella Ave., Mountain View, CA 94043, (415) 965-7900; DIAMOND FLOWER ELECTRIC INSTRUMENT CO. (USA) INC., 2544 Cort St., W. Sacramento, CA 95691, (916) 373-1234; EPSON AMERICA, 2780 Lomita Blvd., Torrance, CA 90505, (800) 421-5426; HEWLETT-PACKARD CORP., 3000 Hanover St., Palo Alto, CA 94304, (415) 857-1501, (800) 367-4772; LASER OPTICAL TECHNOLOGY, 1803 Mission, Santa Cruz, CA 95060, (408) 426-7171; MICROTEK LAB. INC., 16901 S. Western Ave., Gardena, CA 90247, (213) 321-2121; PACKARD BELL ELECTRONICS, INC., 21800 Oxnard St., Suite 700, Woodland Hills, CA 91367, (818) 716-2727; PANASONIC CORP., 2 Panasonic Way, Secaucus, NJ 07094, (201) 348-7000; PRINCETON GRAPHIC SYSTEMS, 601 Ewing St., Princeton, NJ 08540, (609) 683-1660, (800) 221-1490 outside NJ; SABA TECHNOLOGIES, INC., 9300 S.W. Gemini Dr., Beaverton, OR 97005, (503) 626-7050; TAXAN USA CORPORATION, 18005 Courtney Court, City of Industry, CA 91748, (818) 810-1291; THUNDERWARE, INC., 21 Orinda Way, Orinda, CA 94563, (415) 254-6581

A GLOSSARY OF SCANNER TERMS

Bit-map: An arrangement of dots on a computer screen, each represented by one bit.

Continuous tone: A graphic composed of a smooth range of shades, as a photograph.

Data compression: A method of reducing the size of data files and thus lowering the amount of memory required for storage, without losing any of the data.

Dithering: A computer technique that uses dot patterns to simulate shades of gray in an image.

DPI: Dots per inch; a measure of the resolution of an image.

Digitize: The process of converting a physical image into computerized form.

Gray scales: An assignment by the computer of specific shades of gray for each dot in a digitized image.

Halftones: A photo engraving in which the gray shades of the original photograph are simulated by duplicating the image through a screen to break it into a pattern of dots of differing size.

OCR: Optical Character Recognition; the ability to scan a document and convert text characters into individual digital computer codes for each character.

TIFF: Tagged Image File Format; a common file format used for storing scanned graphics data that can be used by many IBM and Macintosh applications programs.

fying the resolution. Some scanner software lets you edit the image, changing it dot-by-dot.

But usually the best way to manipulate the image is to load it into your applications software. Since you're likely to integrate the image with text or other graphics, you'll want to do this anyway. To do so, you'll have to save the image in a file format used by your desktop-publishing, graphics, or word-processing software.

Your scanner software should give you several file-format options. Look for file types that your computer's software regularly supports, such as MacPaint, PICT, EPSF, and PostScript on the Macintosh and .PCX, EPSF, and Windows Paint on the IBM PC. TIFF (tagged image file format) files are also commonly used by both Macintosh and IBM software.

PRINTING A SCANNED IMAGE

Obtaining a top-quality scanned image doesn't do much good if you're going to print your document with a dot-matrix printer, whose resolution can't match the resolution of the image. Because of this, gray-scale scanning is best used when you have a laser printer or even a typesetting machine.

Dithered halftones, when printed on a laser printer, will look about as good as the photos printed in your local newspaper do. Binary images will have a strong "computery" look to them—a kind of "stair-stepped" look made when blocks of black change instantly to blocks of white. That's not necessarily bad, if you can control it; indeed, many stunning special effects can be added after you have captured your scanned image.

In essence, when you use a scanner you must know

TEACH YOUR COMPUTER TO READ

Scanners with Optical Character Recognition (OCR) Software Can Read Text

We learn to read by recognizing the basic graphic shapes of the letters of the alphabet. Reading may seem simple, but it's quite a complex process, as you'll find when you try to teach your computer to read. The technique is called *optical character recognition* (OCR), which makes use of a scanner and OCR software. You pass a sheet of text through the scanner, read it into the computer, load the file into your word processor, and edit or print it. The obvious benefit is that you don't have to type the page of text, letter by letter.

Here's how it works. As the scanner "reads," OCR software either matches the shape of each character with a library of stored reference shapes or analyzes the features (arcs and strokes) of the character to determine its identity. Ideally, the software identifies each letter, number, and punctuation mark. The OCR software has a wide variety of fonts (see chart) in its library. If it doesn't have the right font, it guesses. Some OCR software has a "correction" mode so that you can type in the right character.

Some scanners are quite slow, even if the software recognizes the font exactly. If

the scanner has trouble reading the characters, it stops every two or three letters for you to identify the right one. But, any scanner can read a manuscript with a common font much more quickly than you can type it in. And once in the computer, the ASCII file can be loaded into most word processors.

OCR SOFTWARE

Several scanner manufacturers sell OCR software as an option (see chart). Several software companies, too, have developed programs that work with many of the popular graphics scanners. Essex Publishing ([201] 783-6940) offers PC-OCR (\$385), which takes input in 16 different typesets from the Hewlett-Packard ScanJet and other scanners and converts it into PC-compatible files. Olduvai Corp. ([305] 665-4665) offers two versions of its OCR software for the Macintosh computer. *Read It! TS* (\$149) is designed to work with the low-cost ThunderScan printer-driven scanner, and *Read It! O.C.R.* (\$395) works with most other scanner models. Both are versions 1.5; free 2.0 upgrades are also available.

what you want to do with the captured image. And that means you must think of the entire system—computer, scanner and software, and printer—as a whole. And often the weak link is the printer.

What if you don't have a laser printer? Should that keep you from buying a scanner for your system? Not really; you can have a lot of fun and add a lot of interest to your newsletters and other documents with a simple graphics scanner. The results won't be as good, but for the price of a hand-held model or one that runs on your dot-matrix printer, you can get a variety of interesting graphic effects. And, if you have a 24-pin dot-matrix printer, they'll look pretty good.

A BUSINESS OPPORTUNITY

Mastering scanners could lead you to a new part-time business—custom graphics and text scanning. For instance, you may be able to make money by helping local businesses convert data on paper into computer form. You can offer OCR translation with your new desktop scanner. You may find a local desktop publisher who needs images scanned for a book or newsletter project. You may find a real-estate broker who hasn't even considered the possibility of digitizing the many photos of houses he has on file. And so on.

Whatever you do, you'll be seeing and hearing more about scanners in the future. With the rise of desktop publishing, the success of the graphical interface on the Macintosh and IBM's upcoming Presentation Manager, graphics are becoming a bigger factor in computer work. Scanners have arrived, they're affordable, and they'll keep improving. ■

MAKING MONEY



Musician Mark Freedman in his Manhattan recording studio.

MAKING MUSIC

THESE PROFESSIONAL MUSICIANS STRIKE CHORDS—
AND EARN LIVINGS—OUT OF THEIR HOMESPUN
COMPUTERIZED RECORDING STUDIOS

BY JOEY LATIMER

As music software and hardware become more sophisticated, so do businesses providing musical services. Drove of musicians—outfitted with computers, synthesizers, and recording gear—are heading home to make beautiful music and getting paid for it. Although their home offices more closely resemble recording studios than traditional office setups, like other home-based professionals, they find that they get more work done and have greater control.

If you watch "Cagney and Lacey" or the "CBS Movie of the Week" or listen to the WAVE, a Los Angeles radio station, or have been to an exhibit at the

St. Louis Science Center, then you may have heard the music of people who are profiled here.

KAYTE AND JACK GOGA:

A MUSICAL MARRIAGE

Kayte and Jack Goga, both accomplished musicians, fill three rooms of their Woodland Hills, California, home with musical equipment. Aside from Kayte's occasional performing and teaching, their income comes from the projects they do at home.

Some of the music composed and recorded at the Goga home has been heard on "Cagney and Lacey," the "CBS Movie of the Week," "Children's Classics" on PBS, and "Eye On Hollywood" and at the St. Louis Science Center in Missouri. Other projects currently in progress include music for planetarium light shows and a

new movie called *Savage Harbor* starring Frank Stallone.

The work is done in a recording studio built around an Atari 1040ST computer with sequencing software, a host of MIDI keyboards and software for storing their sounds, a drum machine, two eight-track recorders and one two-track recorder, and many other devices used for special effects, video, and film work.

"The computer is involved in almost every project," remarks Jack. "It makes everything twice as easy, twice as quick. To be honest, I couldn't ever relinquish the control I have with computers."

Kayte agrees: "They're almost a necessity. We've been in situations where we recorded a track for a vocalist, and all of a sudden he decides that he wants the track in another

JOEY LATIMER, a technical editor for FAMILY & HOME-OFFICE COMPUTING, writes all of the magazine's music programs.

PHOTOGRAPH BY JOSEPH BERGER

key. If you don't have a computer to transpose the track, then you're stuck. You'd have to go back, get the musicians, and record the whole thing over again."

The Gogas are always working to attract new business, a process that involves making demo tapes and then taking them with a resumé to prospective clients. Once a client materializes, the Gogas jump into action. "Basically what happens," says Kayte, "is someone comes to us with a musical project, let's say a movie, a record project, a songwriting demo, or a television show. Depending on the project, some things I'm better suited for, and for other things Jack has stronger concepts or ideas. It's give-and-take when you work with a partner."

"The nice thing about the two of us is that we are coming from different directions," says Kayte, who earned a degree in computer science. "He's focused on the writing, the arranging, and the business aspects, and I am more conscious of the performance aspect. Also, by virtue of the fact that I have a degree in computer science, I've always taken a big interest in the technical side, including synthesizer programming and playing with music software."

The Gogas have encountered few problems as a result of working together at home. Says Kayte: "One nice thing about both of us being in music is that we don't argue about where we spend our money."

MARK FREEDMAN:

A STUDIO IN THE SKY

There are some appetizing reasons why such musicians as Laurie Anderson, Jerry Harrison (of Talking Heads fame), and Junior Walker (remember the All-Stars?) relish renting out the Battery Sound recording studio. After a grueling session, studio owner Mark Freedman has been known to run into the kitchen and return with homemade cookies or even a roasted turkey for his visitors. And of course, Freedman is also known for his good taste in musical equipment.

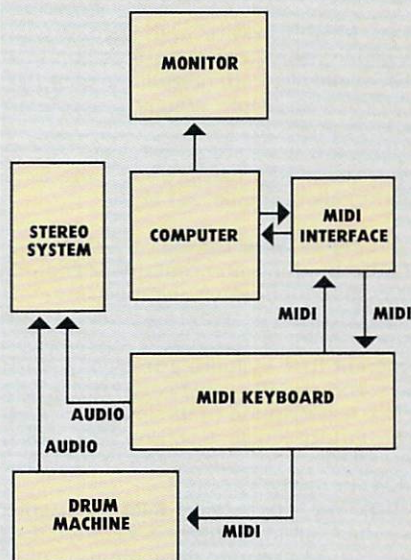
According to 37-year-old Freedman, musicians are attracted to the high-tech, yet homespun atmosphere of Battery Sound. "It's very cozy; there's a kitchen, wooden floors, and wooden walls," he says. "The studio has windows that put people in a great mood." Those windows are so uplifting because they are 22 floors above the ground, overlooking lower Manhattan, the New York Harbor, and the Jersey Shore.

Battery Sound also thrives because

THE INFLUENCE OF MIDI

The MIDI interface specification has made work at home possible for many musicians. In 1983, manufacturers of electronic instruments agreed on a standard way for instruments from different companies to communicate with each other. This standard, MIDI (Musical Instrument Digital Interface), was widely adopted by makers of electronic instruments. It didn't take long for musicians to discover that computers, when rigged with a MIDI interface, software, and electronic instruments, work well as the brains of a modern music studio (see diagram, right, of a typical MIDI setup).

Running specially designed recording software, the computer can act as the master clock for synchronizing MIDI instruments together during the playback of a recorded song. By using other software, it's possible to edit and print musical scores or even compose music mathematically. Music processed by the computer can be saved for later listening and editing, and the information to reproduce songs and sounds can be sent from one computer to another.



A TYPICAL MIDI SETUP

computers are successfully incorporated into the creative process. "It's a 24-track studio and features a Fairlight Series 3 (a multipurpose computerized music workstation) as a centerpiece," says Freedman. In addition to the Fairlight, Battery Sound has a Macintosh. "If you want to compose at home, you can bring in your disks, and we can MIDI the Macintosh up to the Fairlight."

"We've done a lot of film scores that way. The Fairlight sounds so nice, . . . and can also automate, via MIDI, all the outboard gear and show it graphically. It's very powerful."

In addition to renting his studio to other artists, Freedman uses it to compose and produce music for his own LPs and for films and promotional videos. In fact, Freedman, who holds a master's degree in music composition from The City University of New York, had never planned to get into the recording business at all.

"The composing and the musicianship are really what came first," says Freedman. "The recording engineering came from just doing the music. As time went on, I got more and more into the equipment for two reasons. I wanted to use the equipment to do my own music because you have to have a certain level of equipment to compete—to realize your ideas—and number two, it was a way of making an immediate living."

BRIAN VIGO:

A MEDLEY OF MONEY-MAKING IDEAS
The digital sounds of New Age music have been filling Brian Vigo's North

Hollywood home, but they haven't been coming from a compact disc player. "I've been working on an album of New Age music called *Dream Journey*. It's all computerized, strictly digital," explains Vigo. "I've also done jingles for the WAVE (an L.A. radio station) and for commercials."

Vigo, who often works 12-hour days, has been planning his career for a long time. The 29-year-old took music lessons as a child, received an undergraduate degree in music from the University of South Florida, and continued his studies after college.

However, the recording studio in his bedroom was something Vigo probably never planned. Because he dedicates so much of his time these days to working on his album, using a home studio is a lot more cost-effective than renting outside studio space.

Vigo uses his home as a preproduction facility for himself and for a number of other musicians. "Clients can see if they like a song before they spend a lot of money in a big studio." His clients usually pay him on a per-hour basis to record their songs into his computer and then play them back through his range of synthesizers. "It sounds great coming straight off the synthesizers," boasts Vigo.

While a student at the Dick Grove Music School in Los Angeles, Vigo learned about different ways of using computers with music. The computing power behind his studio comes from an IBM PC clone, which is equipped with a 20MB hard-disk drive, an Epson FX-80 printer, a

FOR MORE INFORMATION ABOUT MIDI...

Most MIDI software and hardware are available through music stores and mail-order catalogs, both of which usually have trained salespeople assigned specifically to MIDI products.

Here are newsletters, catalogs, and organizations that can provide more information about music and MIDI:

The Future Music Catalog carries a variety of MIDI products and contains friendly articles and information about getting started making music with computers. Future Music offers a \$15-a-year membership program that includes a free copy of *Understanding MIDI*, a 98-page booklet, and a free subscription to its newsletter. Contact: Future Music, P.O. Box 1090, Reno, NV 89504; (702) 359-6434, (702) 826-6434, or (800) FOR-MIDI.

IMA, the International MIDI Association, is a membership-funded association dedicated to the accurate dissemination of information pertaining to MIDI. IMA publishes an information newsletter called the *IMA Bulletin*. Individual membership costs \$40 a year. Contact: IMA, 5316 West 57th St., Los Angeles, CA 90056; (213) 649-6434.

The Musician's Music Software Catalog is a discount catalog of educational software, MIDI interfaces, cables, accessories, and more. Also included in the catalog is an introduction to MIDI capabilities and

MIDI system configurations. Contact: Digital Arts & Technologies, P.O. Box 11, Milford, CT 06460; (203) 874-9080.

NRI School of Electronics, a division of McGraw-Hill Continuing Education Center, is offering a home-based Electronic Music Technology correspondence course built around a MIDI-equipped computer, MIDI synthesizer, and MIDI software (all of which you keep at the end of the course). For a free catalog, write to: NRI School of Electronics, McGraw-Hill Continuing Education Center, 3939 Wisconsin Ave. NW, Washington, DC 20016; (202) 244-1600.

Passport Designs, Inc., the largest manufacturer of MIDI software and hardware, has published a free 16-page booklet entitled *Passport to MIDI*. The booklet discusses the basics of starting a MIDI system, including diagrams and an overview of Passport's MIDI product line, and a glossary of MIDI terms. To order, call or write: Passport Designs, Inc., 625 Miramontes St., Half Moon Bay, CA 94019; (415) 726-0280.

Roland Users Group Magazine is a quarterly publication that provides information on new music products and applications, including question-and-answer guides to MIDI, software listings, and special events. For a free subscription, contact: Roland Corp., 7200 Dominion Circle, Los Angeles, CA 90040; (213) 685-5141.

A GLOSSARY OF MUSIC TERMS

Drum Machine: An electronic musical instrument that simulates the sounds of a drum set. Most are MIDI compatible and are played by pressing buttons.

Edit: To alter musical information. This is helpful when polishing a piece of music or shaping a synthesized sound.

MIDI Controller: A specially designed instrument for playing music that is converted into MIDI information. Most MIDI controllers are piano-type electronic keyboards, but some are patterned after wind instruments, guitars, and drums.

MIDI Device: A synthesizer, sampler, controller, sound module, computer, special-effects unit, or any other useful piece of hardware, capable of sending and receiving MIDI information.

MIDI Information: Representations of musical performance or activity. These messages carry information about notes played, timing, playing intensity, and more.

MIDI Interface: This is the basic link between the computer and MIDI instruments, synthesizers, samplers, controllers, or other MIDI equipment.

MIDI Program: Software that lets you control and interact with MIDI devices.

Multitrack Tape Recorder: A tape recorder containing several independent tracks for recording music in segments of one instrument or one musical part at a time. The tracks are combined for final assembly and playback of a piece of music.

Music Notation Software: Programs for editing and printing musical scores. Most music notation programs let you assemble notes and other musical symbols on staves for later playback or printing of music. Some function only to let you print scores and lead sheets.

Sampler: An electronic device for digitally recording and storing the sounds of instruments and other sounds for later reproduction. The playback of sound "samples" can be triggered by an electronic keyboard or other MIDI controller.

Sequencer: Program for recording, editing, and playing back musical information. Most sequencers work like a multitrack tape recorder and record performances played on a MIDI instrument.

Synthesizer: Electronic instrument used for simulating other instruments or creating new musical sounds. Most synthesizers are played from a keyboard.

monitor, and a MIDI interface.

When he's not programming music, Vigo uses his computer for writing letters, keeping mailing lists, and storing sounds and recording notes. He would like to add automated mixing to his studio and, like many other computer users, wants to upgrade to a more powerful machine to speed up his work.

He also uses his computer for the live performances he does with a guitar-playing friend. "We do corporate parties, weddings, and private parties. I use the sequencer live," says Vigo, who preprograms drum, bass, and keyboard parts into his computer and uses them later at the affairs.

Currently, about 65 percent of Vigo's yearly income is earned via his bedroom-based recording studio; he makes the remainder at party gigs. But if his album—which is scheduled for completion in September—sells well, Vigo may say good-bye to the parties and make all of his money from his home office.

OPPORTUNITIES FOR MUSICIANS

As the stories of the people profiled here demonstrate, building a music-related business requires hard work, dedication, and persistence. But the opportunities are many, and the rewards can be great. If you're a musician, here are just a few occupations you might be able to pursue using your expertise, computer, and MIDI products.

Composing: Create music for film, television shows, theater, commercials, promotional videos, and other projects.

Consulting: Set up a consulting business to help others with MIDI. Help clients choose and purchase the right hardware and software to suit their particular needs.

Desktop Music Publishing: Edit and print lead sheets, musical scores, arrangements, and lyric sheets.

Recording: Rent your MIDI studio and recording services to other musicians.

Sound Designing: Use your computer to create and sell custom musical instrument sounds (patches) for popular synthesizers.

Teaching: Employ your MIDI studio as a teaching aid for music and recording students.

More musicians than you might imagine have carved out lucrative careers for themselves in such fields as these. And best of all, they didn't have to leave home to do so. ■

PRODUCT REVIEWS

EVALUATIONS OF COMPUTERS, PERIPHERALS, AND OTHER HOME-OFFICE EQUIPMENT

A+ Mouse

MANUFACTURER: MSC Technologies, Inc.

ADDRESS: 2600 San Tomas Expressway, Santa Clara, CA 95051; (408) 988-0211

HARDWARE REQUIREMENTS: Apple IIe/IIc/IIGs; IBM PC, PS/2, and compatibles; Macintosh 512K/Plus/SE/II
SUGGESTED LIST PRICE: \$99

I had been curious about the A+ Mouse (called PC Mouse for the IBM PC, PS/2, and compatibles) for a long time. Unlike its competition, the A+ Mouse uses a light that reflects off a mirror-like, grid-lined pad to position the cursor on-screen, eschewing all mechanical parts. As you may know, equipment that's totally electronic tends to last longer than equipment that's part electronic,



This A+ Mouse is superior to the mouse that Apple supplies with its computers.

part mechanical. The A+ Mouse is the only brand of mouse whose manufacturer is so secure in the durability of its product that you get a lifetime warranty.

But is the A+ Mouse really that much better than the other available rodents? After having this mouse attached to my Macintosh SE for almost two months, I'll say that it's definitely superior to the perfectly fine mouse Apple supplies with its computers. Because the A+ Mouse doesn't pick up dirt (as Apple's and most other mice do with their roller balls), it moves smoothly all the time—and I don't have to take it apart and clean it. In fact, even though the supplied mouse pad seems to attract a light layer of dust,

that doesn't affect the efficiency of the mouse. Please note, though, that without the pad, the A+ Mouse doesn't work. For anyone who doesn't like restricting the mouse's movements, the mouse pad is a drawback.

The optical mouse comes in different models, including versions for the Apple IIe/IIc, Apple IIGs, Macintosh SE/II, and Macintosh 512K/Plus. The PC Mouse is available for the IBM PC, PS/2, and compatibles. If you need a new mouse or if you're simply dissatisfied with your existing one—and if you don't mind using a mouse pad—then the A+ Mouse might be the best "lifetime" computer investment you can make this year.

—DAVID HALLERMAN

CIRCLE READER SERVICE 100

AT&T Cordless Telephone 5310

MANUFACTURER: AT&T

ADDRESS: 4 Campus Drive, Room N2C06, Parsippany, NJ 07054; (800) 222-0300

SUGGESTED LIST PRICE: \$220

The three basic questions you should ask yourself before purchasing a cordless telephone are: (1) Does it deliver a clear sound?, (2) Does it have lots of features that are easy to use?, and (3) Does it feel like a corded phone? The cordless 5310 from AT&T answers a resounding "yes" to all three, and, in the cordless market, it's the phone to beat.

Probably the most important aspect of the three questions is the quality of the sound. The 5310 delivered solid sound—whether I was near the base or far from it, people on the other end said I came through loudly and clearly, and so did they. And AT&T appears concerned about line quality. The 5310 has three separate channels: these aren't separate telephone lines, but rather different frequencies within the line, so if there is too much static or interference, you can switch to a channel that might be less noisy—even during a phone call.

The 5310 is loaded with features. My favorite is the two-way intercom;



This cordless phone from AT&T delivers solid sound.

if you have the handset in the backyard, for instance, you can carry on normal conversations with people who are inside the house, near the phone's base. And the really great thing about the intercom is that you can use it even if you're in the middle of a phone call. Just put the call on hold. Add this to such features as paging (people standing or sitting near the base of the phone can contact the handset via a button that beeps, and vice versa) and more standard features such as automatic redial and programmable quick-dial of up to nine phone numbers, and you have a phone that does more than you could ask it to do. Finally, the 5310 just feels like a real phone. The handset weighs about a pound, the charging base, about a pound and a half, and when you use it, you feel like you're using a phone as substantial as the ones that have cords.

There are a couple of drawbacks, however. The 5310 can handle only one telephone line, which is a disadvantage for people who have both a business line and a personal line at home. Also, the included cradle that can be affixed to the wall to serve as another resting place for the handset doesn't have recharging capabilities. (AT&T says that the handset needs to be recharged every five to nine days.) These complaints, however, are minor and are not reasons enough to reject the AT&T 5310. It's one of the best planned, constructed, and designed cordless phones on the market today.

—MARTIN BIHL

CIRCLE READER SERVICE 101

PRODUCT REVIEWS

CODE-A-PHONE Model 5530 Answering Machine

MANUFACTURER: Code-A-Phone Corp.
ADDRESS: P.O. Box 5656, Portland,
OR 97228; (503) 655-8940
SUGGESTED LIST PRICE: \$150

The first good news about the CODE-A-PHONE Model 5530 answering machine arrived as soon as I opened the box and saw that it's as small as a fat paperback. Its compactness is great if, like me, you have virtually no space next to your telephone. The next pleasant surprise came when I realized how simple it is to use—four marked buttons and the usual two extension cords are all you have to deal with. If you've used other machines, you can probably start operating it without even cracking the instruction book, which has diagrams clearly illustrating the machine's features and shows you exactly what to plug in where. The tapes are in the machine, ready to go. You just record the outgoing message, and you're in business, as long as the ready light is on.

Don't let its small size and simplicity fool you—the CODE-A-PHONE is a state-of-the-art answering machine, ideal for moonlighters like me. If I'm waiting to hear from an editor about a story I proposed (I don't like to give out my daytime office number), a reliable machine with advanced features to use at home is a wise, if not essential, investment.

As you can expect from the machine's size, the 5530 uses micro-cassettes. With these tapes, you can record a phone conversation or interview and then play it back on the answering machine or on a tape recorder.

Another welcome feature: a touch-tone remote system, which is far better than a separate remote beeper that's easily lost or forgotten at home.

You access calls from a touch-tone phone, using an assigned three-digit number. (There's also an adapter available [\$20] that converts a rotary phone to touch tone.) You can also rewind or fast forward calls remotely, using various numbers—but after two or three unsuccessful tries, I gave up on this feature. And while you're on the road, you can record a new outgoing message saying "I'll be out until 8 p.m.," or "I'll be away until Tuesday."

Like other machines, you can set this one to answer after either two



The CODE-A-PHONE answering machine is simple to use and compact.

or four rings and to answer only (not to take messages.) ML (message limit) cuts a caller off after 60 seconds, while VC (voice control) stops recording when the caller stops talking.

Being able to record a conversation is by far the best feature for a writer. You just press the record button and remember to flip the tape over after 30 minutes. There's also a memo feature that lets you record reminders to yourself that play back when you review messages. I haven't found use for that—although I do call into my answering machine to leave messages for myself.

When you work part-time from your home, having faith in your phone machine is a necessity. While the CODE-A-PHONE Model 5530 doesn't have features that you can't find on a few of the other advanced answering machines, it's certainly a machine that lets you leave home with confidence.

—KATHRYN BONN

CIRCLE READER SERVICE 102

Hewlett-Packard LaserJet Series II

MANUFACTURER: Hewlett-Packard
ADDRESS: 3000 Hanover St., Palo Alto, CA 94304; (800) 752-0900
HARDWARE REQUIREMENTS: Apple II series, IBM PC and compatibles, and Macintosh
SUGGESTED LIST PRICE: \$2,595

There are inherent dangers in purchasing a Hewlett-Packard LaserJet Series II; you'll never be able to settle for dot-matrix again, even a 24-pin near-letter-quality printer! Now that a LaserJet II is in my life, I won't part with it. After seeing the vastly improved output and knowing I can quickly create documents with crisp, proportional typefaces, I can't go back.

And now that the street price of the basic LaserJet II has dropped to less than \$1,700, there is one less reason to put off equipping your

home office with a printer that delivers professional-quality letters, proposals, and desktop-published documents. Once a page is in the printer's memory, output is faster than with most dot-matrix printers, and the sophisticated look of your printed materials and correspondence will help insure that your customer's all-important first impression is a lasting one.

Although you may sacrifice some of the speed (8 versus 12 pages per minute) and fancy paper-handling versatility of a Toshiba PageLaser 12 or the scalable font capabilities of an Apple LaserWriter IINT, you'll be buying a quiet, space-saving, affordable laser printer. The LaserJet Series II will meet the demands of most home-office and business applications, including desktop publishing.

From unpacking the compact unit (careful: the printer weighs about 50 pounds) to creating the first print-out took about two hours. It went without a major hitch, even though I'd never before set up a laser printer. That included reading much of the documentation, *Getting Started with the LaserJet Series II*, which gives clear, step-by-step, illustrated instructions on connecting the printer to your computer. It's hard to go wrong if you follow these instructions. And considering there's no stack of paper to fuss with, the LaserJet actually takes up less desk space than my old Epson LQ 800 did.

At one point during setup, I became frustrated when the internal font test wouldn't print out. I called the company's tech support line, but gave up after holding for five minutes. Eventually, I found the answer myself in the manual; I'd missed a setting on the printer's control panel. Although basically easy to follow, the manual contains charts of complex printer escape codes, or commands, which can be daunting to the uninitiated. You may never have to deal with them, however.

Unlike such laser printers as Apple's LaserWriter IINT, which comes with the PostScript page description language built into ROM and a more extensive array of internal fonts, the LaserJet II uses font cartridges that plug into slots below the paper tray. Choose from a selection of 23 manufactured by Hewlett-Packard; each costs about \$150 and contains one or two families of fonts, or typestyles, in a range of sizes. (Other manufacturers also make HP-com-

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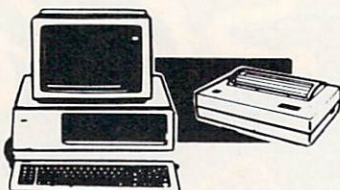
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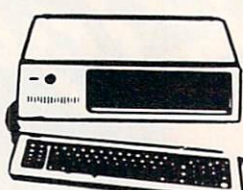
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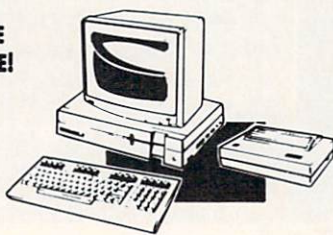
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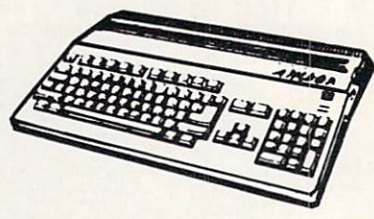
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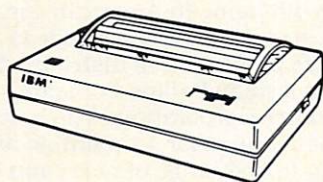
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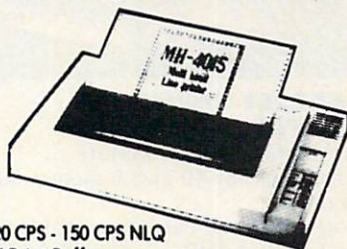
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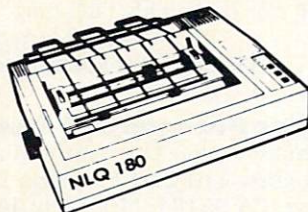
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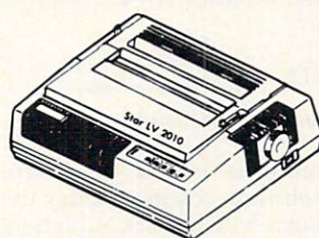
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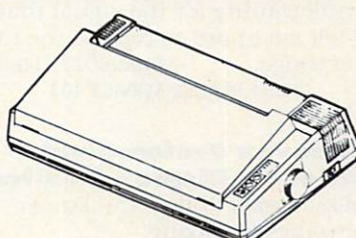
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PRODUCT REVIEWS



LASERJET SERIES II SPECIFICATIONS

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MEMORY: 512K standard; expandable to 1.5-, 2.5-, or 4.5MB
WARRANTY: One year
PAPER FEED: Automatic or manual single-sheet; 8.5-by-11 inches, 8.5-by-14 inches; manual envelope feed

patible cartridges.) Simply plug in the cartridge, select the correct font table in your software's printer driver, and you're off! As your applications diversify, you may want even more fonts. Hewlett-Packard's Font-Load (\$200) allows you to run an avalanche of font software being released by font publishers such as Bitstream.

Three months and 3,000 pages later, I noticed the first hint of a lag in output quality. A routine cleaning of the contact drum solved the problem, however, and as of press time, I'm still waiting for the signal that will tell me I need to replace the toner cartridge. —CHARLOTTE PIERCE

CIRCLE READER SERVICE 103

Magnavox Professional Multimode Display Monitor

MANUFACTURER: Philips Consumer Electronics Company
ADDRESS: 14810 Interstate 40 & Strawberry Plains Pike, Knoxville, TN 37914; (615) 521-4316
HARDWARE REQUIREMENTS: Amiga, IBM PC or compatible, Macintosh II
SUGGESTED LIST PRICE: \$899

With the price of high-quality video boards and color monitors coming down, you can stop telling yourself that real computer folks don't use color. The fact is that once you've computed on a high-resolution color system, you won't want to return to drabville.

When Magnavox named this video display "Multimode," it wasn't kidding; the monitor accepts input signals from almost all types of color display cards. And the monitor's

maximum resolution as measured by pixels (screen dots) is 926 by 580, a count that compares favorably with monitors at twice the price. Its other features include a 13-inch (diagonal) viewable screen with a reduced-glare matte surface that's easy to look at for long computing sessions; you can instantly toggle the "text" mode (monochrome green) via a front-panel switch; and you can feed the monitor audio through an RCA jack on the back panel.

If you own an IBM PC or compatible, you should use the Multimode with an EGA (Enhanced Graphics Adapter) or a VGA (Video Graphics Array) card to get the most of the Multimode's display quality. It will work, however, with just about any video board. But be prepared for disappointment if you use it with your CGA (Color Graphics Adapter) board. Why? Because the video quality of CGA is strictly "medium resolution," it makes no difference how good the



Magnavox's Multimode monitor

monitor is. In fact, the sharper the resolution, the more ridgy the CGA images will look. So a high-powered video board should be the next item on your computer shopping list.

To use the Multimode, I simply connected the supplied cable to the video out of my computer, made sure the Color Mode switch was set to "Normal" and the RGB Mode switch to "Digital" ("Analog," for VGA, Macintosh II, or Amiga), turned on the computer and went to work.

The power switch and the controls for brightness, contrast, horizontal centering, and audio level are on the front panel, along with the "Text" toggle. Vertical hold, size, and position adjustments must be made with a TV tuning tool through openings in the back panel.

The display is evenly sharp from

edge to center and from top to bottom—no "pincushion" or "barrel" distortion—with minutely better resolution for text in the "Text" mode. However, the overall picture was tilted slightly off the horizontal, a possible result of excessive jolting when shipping the test monitor.

Despite the fact that Magnavox is an old name in American consumer electronics, the Multimode is a Japanese product. It is distributed and serviced by Philips Consumer Electronics Corporation, which warrants the monitor for 12 months, affording full coverage of parts and labor costs—provided you haven't dunked or dropped or done other naughty things to it.

With so many brands and types of monitors on the market, it is certainly not easy to decide how to spend one's money. In fact, Magnavox offers an EGA monitor for about \$649. (The suggested list price of the Multimode is \$899, although I found a mail-order price of \$435.)

But what's especially appealing about the Multimode is its ability to grow with your video needs. It will easily handle VGA signals; VGA is the newest standard in IBM display technology. Certainly anyone who expects to be doing a lot of graphics—desktop publishing, Computer-Aided Design (CAD), and so on—should make a video upgrade that will not so quickly fall short.

—HENRY F. BEECHHOLD

CIRCLE READER SERVICE 104

Mitac Paragon 286 Computer

MANUFACTURER: American Mitac Corp.
ADDRESS: 410 East Plumeria Dr., San Jose, CA 95134; (408) 432-1160 or (800) 648-2287
SUGGESTED LIST PRICE: \$1,995

When I first took the Mitac Paragon 286 out of its box, I was amazed at how all of the controls fit so neatly and compactly on the front of the system. This "control panel" has the power switch, a keyboard lock, a system reset button, a 12MHz light, the hard-disk light, and the keyboard connector. The three disk drives in the review system were also conveniently and smartly placed in the unit. This small-footprint machine has all the features you'll need—and offers the performance of a full-size AT-compatible computer.

The system has space for three disk drives. These spaces can be used to house a hard-disk drive, a

5.25-inch, or a 3.5-inch floppy-disk drive. The three drives in our review system were a 1.2MB 5.25-inch floppy-disk drive, a 1.44MB 3.5-inch floppy-disk drive, and a 40MB hard-disk drive with an access speed of 28 milliseconds. I installed a multitude of software packages on the hard drive, including *Microsoft Windows*, *Microsoft Excel*, *PC Paintbrush*, *Procomm*, *Quattro*, and *XyWrite III* +.

The speed of the Paragon 286 is phenomenal. This baby hustles! It zips through entries and calculations in *Quattro* and *Excel* spreadsheets and whisks through commands in my *XyWrite* word processor. This machine saves me an enormous amount of time. Between the hard-disk drive and the speed of the 80286 12MHz microprocessor in this AT, more is accomplished in a shorter amount of time. No more waiting for the system to boot up; no more waiting to retrieve files; no more waiting for much of anything!

At first, the enhanced keyboard (with separate cursor control keys, a numeric keypad, and the function keys at the top) did not thrill me. Being so used to my mushy Kaypro PC keyboard (with the function keys on the left side), I was reluctant to part with it. But after using the enhanced keyboard for a few days, the key positions were much more comfortable and the feeling was firmer than other keyboards I've used. After a few weeks, I noticed how much quicker and easier my fingers moved across the keys.

The optional 12-inch color monitor (\$479) is EGA compatible. Once I found the text switch for changing from green or amber text to color, it was smooth sailing on clear and colorful waters. I played with the font styles in *Microsoft Windows* and was delighted to see that all the text was clear and readable no matter how large or small the type. On this monitor, the colors were bright, but the pictures were sharper and more vivid on my NEC MultiSync II monitor.

There was one small thing on this monitor that irked me—the power button. It's hard to push the button on and off with your finger because it is round and flush against the face of the monitor. Put it this way—no long fingernails. Here's a tip: using a pencil eraser will help solve this problem.

The Paragon 286 comes with MS-

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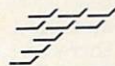
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PRODUCT REVIEWS



MITAC PARAGON 286 COMPUTER SPECIFICATIONS

MICROPROCESSOR: Intel 80286 (8/12MHz)
MEMORY: 1MB, expandable to 8MB on the motherboard

OPERATING SYSTEM: MS-DOS 3.21
BUILT-IN PORTS: Three (one parallel, two serial)

EXPANSION SLOTS: Five (four 16-bit, one 8-bit); one occupied by disk controller card
DISK DRIVES: One 1.2MB 5.25-inch floppy and one 1.44MB 3.5-inch floppy

SOFTWARE INCLUDED: MS-DOS 3.21, GW-BASIC 3.22, Mitac Advanced Disk Manager
WARRANTY: 12 months

OPTIONS: 12-inch EGA monitor (\$479), 12-inch amber monitor (\$110), 1.44MB 3.5-inch floppy-disk drive, 40MB hard-disk drive (\$620)

DOS and GW-BASIC (manuals for each are included). Also included is the *Guide to Operations* for this machine. This manual really doesn't include any "extras" but it does provide basic information you'll need for installing, operating, and expanding your system.

It was a pleasure being able to get an immediate response from this computer instead of having to wait and wait and wait. Overall, the Paragon 286 from Mitac is perfect for any home office. Its speed, size, and price are among the top features of this competitive AT compatible.

—MARIE ALVICH

CIRCLE READER SERVICE 105

MULTI-EGA by BOCA

MANUFACTURER: BOCA Research, Inc.
ADDRESS: 6401 Congress Ave., Boca Raton, FL 33487; (407) 997-6227

HARDWARE REQUIREMENTS: IBM PC/XT/AT or compatible

SUGGESTED LIST PRICE: \$299

To move from a monochrome or medium resolution color monitor to a hi-res color display, you'll need two

pieces of hardware: an Enhanced Graphics Adapter board and a high-resolution color monitor. But suppose you can't afford to make the changeover all at once? If you start with the BOCA ("Best Option Cards Available") MULTI-EGA board, you can continue to use your present monitor indefinitely.

The MULTI-EGA video display board provides these display modes: enhanced EGA (640 by 480 and 752 by 410 pixels of resolution, in multiple frequency), EGA (640 by 350, 16 colors from a palette of 64), standard Color Graphics Adapter (640 by 200, two colors), CGA Double Scan (320 by 400, four colors), standard Monochrome Display Adapter, and Hercules Monochrome Graphics. The board can determine whether the software is CGA or EGA compatible and will switch the video output accordingly. Thus, you can go from CGA to EGA software without having to fiddle with the hardware.

The BOCA card is a short card and uses fewer chips than do most video boards. A big benefit of low chip density is low power consumption.

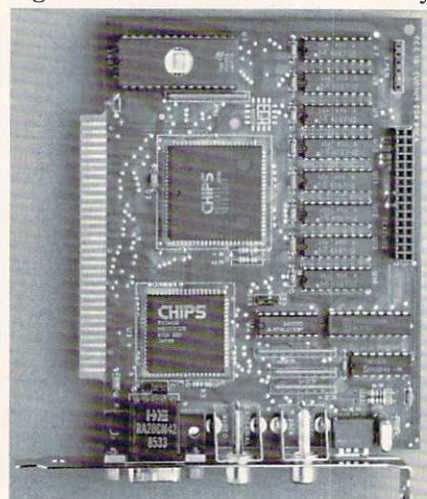
What the MULTI-EGA board does not provide is a VGA (Video Graphics Array) mode. If you don't need 256 colors (simultaneously displayed from a palette of more than 256,000 colors), then you probably won't miss VGA. Although there isn't much software written for VGA at present, IBM and Compaq are pushing VGA hard, as suggested by their decision to end production of EGA cards.

Since the MULTI-EGA card can run monochrome graphics, CGA, and EGA software, you should remove the current video card from your computer and replace it with the BOCA card—although you can set the new board to accept the presence of a second video board. All the mechanics involved in setting up the MULTI-EGA card are clearly explained and illustrated in the BOCA manual.

To make certain that the MULTI-EGA lives up to its claims, I ran it in a PC XT using every type of monitor it supports: monochrome, medium resolution color, EGA color, and multisync EGA color. Everything worked as promised, including automatic switching between software configured for CGA and EGA. And the display is sharp and steady—no snow, shakes, shimmers, or other visual annoyances. Of course, the

quality of the display also depends on the quality of the monitor.

The board can cause serious hardware grief if you've forgotten the monochrome monitor hookup warning stressed in the manual. Let's say



The MULTI-EGA video display board can run monochrome graphics, CGA, and EGA software.

you replace the color monitor temporarily with the monochrome. Same connector, no problem? Right? Definitely wrong. Same connector, possibly big problem: The color video being sent from the board can damage your monochrome monitor—unless you remember to turn off the computer and reset the output-select switches (which are accessible through the mounting bracket of the board). Automatic switching will not work between color output and monochrome output.

In addition to a menu-driven diagnostics program, MULTI-EGA software includes such extras as mode-swapping and switch-setting utilities; a screen saver (to turn off the screen after the computer has idled for a preselected time); and a font designer.

MULTI-EGA is a well-made board that costs as little as \$149 mail order. Important intangibles are a two-year warranty and telephone technical support (your nickel, but no charge for help). Unless you really need the super high-resolution of the newest technology (and remember that monitors supporting this resolution are in the \$1,000 range), this board used with a midpriced, high-resolution color monitor will keep your eyes happy, at least for the present.

—HENRY F. BEECHHOLD

CIRCLE READER SERVICE 106

SOFTWARE GUIDE

Welcome to FAMILY & HOME-OFFICE COMPUTING's Software Guide. The following table relates to the review charts that follow. It lists the various types of computers as designated under "hardware required" (and other hardware designations in this issue) and the models included under each designation.

DESIGNATION	MODELS
Amiga	500, 1000, 2000
Apple	II, II Plus, IIe, IIc, IIgs (in IIe/c mode)
64K Apple	II Plus, IIe, IIc, IIgs (in IIe/c mode)
128K Apple	IIe, IIc, IIgs (in IIe/c mode)
Apple IIgs	IIgs only
Atari	800, 600XL, 800XL, 65XE, 130XE
Atari ST	520ST, 1040ST, MegaST
C 64/128	C 64, C 128 (in 64 mode)
C 128	C 128 only
IBM PC	PC, XT, AT, PS/2, and compatibles
Macintosh	128K, 512K, Plus, SE, II
Tandy CoCo	2, 3

Please note: All Apple designations (except for IIgs) include compatibles such as the Laser 128 or Franklin 500. Titles listed for the IBM PC will also run on most IBM PC compatibles (as well as the IBM PS/2 series); check with the publisher of the program or your dealer for compatibility. Any additional hardware listed is required unless noted as "recommended" or "optional." In many cases, "2nd drive" refers to either a floppy-disk drive or hard-disk drive. KEY: **O** = Overall performance, given the limitations and capacities of the particular computer for which the software is intended. **D** = Documentation, or the instructions that accompany a program. **EH** = Error Handling, the software's capacity to accommodate errors made by the user. **PS** = Play System (in the Entertainment reviews), the quality of the game's design and its playability. **GQ** = Graphics Quality, evaluated in light of each model's graphics capabilities. **EU** = Ease of Use after the initial learning period; varies from computer to computer. **V** = Value for money, or how the software measures up to its price.

BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware required	CP	Ratings						
				O	D	EH	GQ	EU	V	
DS BACKUP+ Design Software, Inc. 1275 W. Roosevelt Road West Chicago, IL 60185 (312) 231-4540 \$80 ©1987	Comprehensive backup utility for hard-disk drive users is menu-driven and much faster than the DOS backup command. If used regularly, saves you from loss of vital documents. Good on-screen prompts help eliminate chances for error. —GEORGE CAMPBELL	256K IBM PC. Hard-disk drive. CGA optional.	N	★	★	★	N/A	A	★	★
HYPER DA Symmetry Corporation 761 E. University Drive Mesa, AZ 85203 (602) 844-2199 \$69 ©1988	A desk accessory that solves the <i>HyperCard</i> dilemma: How do you look at data gathered in <i>HyperCard</i> when you're running another program? <i>HyperDA</i> lets you browse and search through any stack and copy but not change any text or graphics. —DAVID HALLERMAN	512K Macintosh.	N	★	★	★	N/A	E	★	★
KEYNOTES ASSOCIATED PRESS STYLEBOOK Digital Learning Systems 4 Century Drive Parsippany, NJ 07054 (201) 538-6640 \$60 ©1987	Anyone who's concerned about clear, accurate writing can benefit from this memory-resident reference. Demonstrates correct spellings and usage of common words and phrases. Includes a concise and detailed punctuation guide and listings of business, computer, and sports terms. —TAN A. SUMMERS	Reviewed on 256K IBM PC. Also for 512K Macintosh. Hard-disk drive.	N	★	★	★	N/A	E	★	★
PAPERCLIP III Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$50 ©1987	The C 128 supports several notable features in this upgrade of an "old faithful" word processor, such as an 80-column line, a 40,000-word spelling checker, and larger documents that use extra memory. Complex but not complicated. —NORMA ODISIO	C 64/128. C 1750 RAM optional (C 128 only).	N	★	★	★	N/A	A	★	★
PC-GLOBE Comwell Systems, Inc. 2100 S. Rural Road Tempe, AZ 85282 (602) 894-6866 \$60 ©1987	An on-disk world atlas with maps and such information as population, health statistics, and cultural facts. Updated annually for about one-third the cost of the original program. <i>PC-Globe</i> is most appropriate for marketing uses. —TAN A. SUMMERS	256K IBM PC. 2nd drive (hard-disk drive optional); CGA or EGA.	N	★	★	★	★	E	★	★
REFLEX PLUS Borland International 4585 Scotts Valley Drive Scotts Valley, CA 95066 (408) 438-8400 \$279 ©1987-1988	Much of the effort in putting together a powerful, relational database is eliminated here by the Mac's visual interface. When you want to relate a field in one file to a field in another file, all you have to do is draw a line between the two. A winner.† —JOHN LEININGER	512K Macintosh. 2nd drive. Hard-disk drive recommended.	N	★	★	★	N/A	A	★	★
VP-PLANNER PLUS Paperback Software Int'l 2830 Ninth St. Berkeley, CA 94710 (415) 644-2116 \$180 ©1985-1988	An enhanced spreadsheet that works like the popular Lotus 1-2-3, yet includes such extra features as a built-in text editor for word processing and report generation, larger worksheets, and a unique multidimensional database facility.† —ANTHONY GUARDINO	384K IBM PC. 2nd drive recommended. CGA, EGA, VGA, or Hercules for graphs.	N	★	★	★	★	A	★	★

RATINGS KEY **O** Overall performance; **D** Documentation; **EH** Error-Handling; **GQ** Graphics Quality; **EU** Ease of Use; **V** Value for money; **○** Poor; **★** Average; **★★** Good; **★★★** Very Good; **★★★★** Excellent; **N/A** Not Applicable; **E** Easy; **A** Average; **D** Difficult; **CP** Copy Protected, yes or no; **†** Longer review follows chart

BUSINESS & PRODUCTIVITY

Title Publisher Price	Brief description	Hardware required	CP	Ratings						
				O	D	EH	GQ	EU	V	
WEBSTER'S NEW WORLD OUTLINER+ Simon & Schuster Software One Gulf + Western Plaza New York, NY 10023 (212) 373-8882 \$70 ©1987	Especially as a memory-resident program (it can also be a stand-alone), <i>Outliner+</i> can be a big plus for such tasks as planning projects or preparing talks and documents. Also includes a phone directory, address book, and several other helpful extras.† —GEORGE CAMPBELL	256K IBM PC. 2nd drive, hard-disk drive recommended. Does not work with EGA or Hercules graphics programs.	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★ ★	
WORD FINDER Microlytics 300 Main St. East Rochester, NY 14445 (716) 377-0130 \$60 ©1985, 1987	Even if it would help, many people don't bother to use a thesaurus when writing because looking up words takes too much trouble. The trouble is over with <i>Word Finder</i> , though, an on-screen, desk-accessory thesaurus that you can call up at any time.† —GWEN SOLOMON	Reviewed on 512K Macintosh. Also for 256K IBM PC. Hard-disk drive optional.	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★	
W. O. R. K. * AT HOME Britannica Software 345 Fourth St. San Francisco, CA 94107 (415) 546-1866 \$20 ©1987	For an integrated package (word processor, database, and spreadsheet), this program is almost unbelievably inexpensive. Yet it may not be worth it, because the program is not simple to learn or use (many control-key commands, for instance). —MARK BITTMAN	Reviewed on 128K IBM PC. Also for 64K Apple IIe/IIc. 2nd drive. CGA, EGA, or Hercules recommended (IBM).	Y	★ ★ ★ ★	★ ★ ★	★ ★ ★	★	D	★ ★	

EDUCATION & CREATIVITY

Title Publisher Price	Brief description	Hardware required	CP	Ratings						
				O	D	EH	GQ	EU	V	
ALPHABET BLOCKS Bright Star Technology 14450 N.E. 29th Place Bellevue, WA 98007 (206) 885-5446 \$60 ©1986	With adult supervision, children learn letter names and sounds from a clear-speaking elf. Makes excellent use of the Mac's speech and graphic capabilities in an easy-to-use, phonics-based primary-reading program. I easily recommend it. —JUDITH ZORNBERG	1MB Macintosh.	N	★ ★ ★ ★	★ ★ ★	★ ★ ★ ★	★ ★ ★	E	★ ★ ★	
CAREER NAVIGATOR Drake Beam Morin, Inc. 100 Park Ave. New York, NY 10017 (212) 692-7700 \$129 ©1987	Career-counseling program that gives direction and teaches job-search techniques in a creative format that prompts you every step along the way. Helps organize resumes, perfect interview skills, and more. (See long review in <i>Education</i> department.) —MARY FANDEL	256K IBM PC. Printer recommended	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	N/A	E	★ ★ ★	
HOUSE-A-FIRE! Decision Development Corp. 2680 Bishop Drive, #122 San Ramon, CA 94583 (415) 830-8896 \$50 ©1988	Fire-safety simulation that explains the essential ways to prevent fires and how to react in the event of one. Cute graphics may inspire learning, but the program lacks realism and flexibility. Good as an introduction to fire safety. —GWEN SOLOMON	64K Apple.	Y	★ ★	★ ★ ★	★ ★ ★	★ ★	E	★	
SOLARSIM Interstel P.O. Box 57825 Webster, TX 77598 (713) 486-4163 \$35 ©1985	Turn your computer into a planetarium. With this comprehensive simulation of the solar system, you control which planets, stars, and constellations are viewed relative to the time and place. Best if you have working knowledge of math or science.† —JUDITH ZORNBERG	128K IBM PC. CGA. Does not work with Hercules.	N	★ ★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	A	★ ★ ★ ★	
STEPPING STONES, LEVELS I & II Compu-Teach 78 Olive St. New Haven, CT 06511 (203) 777-7738 \$40 each ©1987	Using sounds and colorful animated graphics, Level I of the series introduces letters, numbers, and words to 2-4-year-olds. Level II combines early reading, addition, and sentence-building skills in a creative, self-paced lesson for 5-7-year-olds.† —DORIS ANDERSON	Reviewed on 256K IBM PC. Also for 64K Apple, 512K Macintosh. CGA (IBM).	N	★ ★ ★	★ ★ ★	★ ★ ★	★ ★ ★	E	★ ★ ★	
TYPIST Choice Software P.O. Box 726 Centerville, UT 84014 (801) 292-7900 \$60 ©1987	No-nonsense typing tutor and skill builder that records and evaluates progress. You can customize drills with your own text or play a simple game. Although very effective in improving my speed and accuracy, <i>Typist</i> is for the serious student or adult.—JUDITH ZORNBERG	256K IBM PC.	N	★ ★ ★	★ ★ ★	★ ★ ★	N/A	A	★ ★	

RATINGS KEY O Overall performance; D Documentation; EH Error-Handling; GQ Graphics Quality; EU Ease of Use; V Value for money; ○ Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not Applicable; E Easy; A Average; D Difficult; CP Copy Protected, yes or no; † Longer review follows chart

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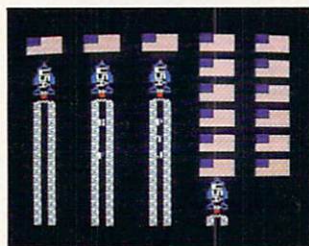
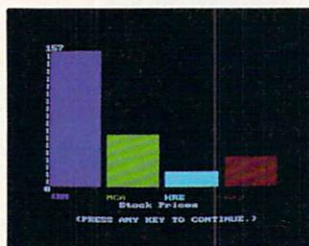
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Apple - Games II Series 0B89601		Atari - Productivity 800/XL/130XE 0B89609	
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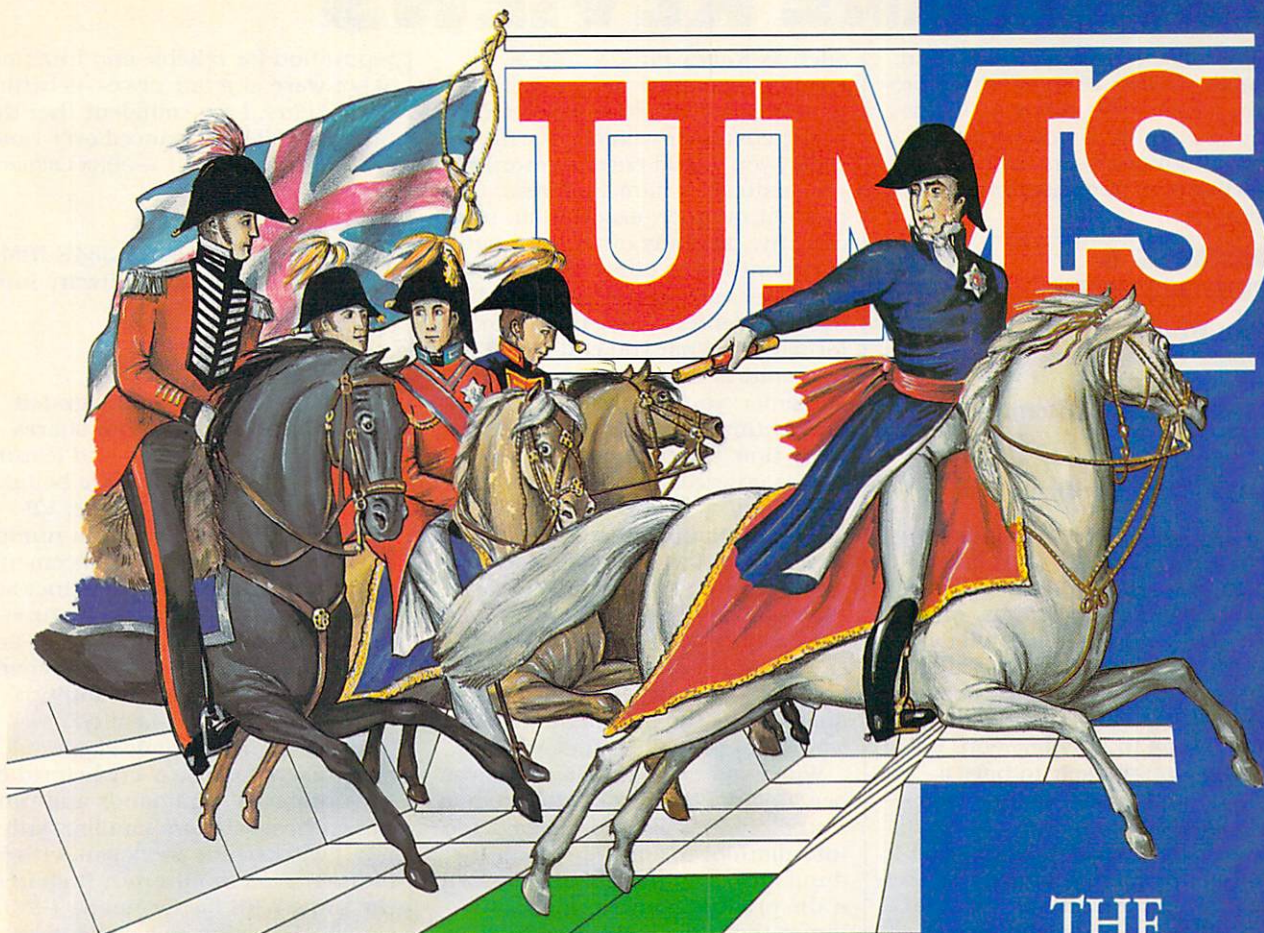
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EDUCATION & CREATIVITY										
Title Publisher Price	Brief description	Hardware required	CP	O	D	EH	GQ	EU	V	
UPTIME: VOL. 1, NOS. 5, 6, 7 Viking Technologies 174 Bellevue Ave. Newport, RI 02840 (401) 849-4925 \$70-\$90 for 12 issues ©1987-1988	Includes eight, ready-to-run programs—both educational and productivity—in each monthly issue. Also includes software reviews often enhanced by short demonstrations that give a good feel for the programs. Not exceptional, but worth a try. —TAN A. SUMMERS	Reviewed on 256K IBM PC. Also for 64K Apple, C 64/128, 512K Macintosh.	N	★	★	★	★	E	★	★
ENTERTAINMENT										
Title Publisher Price	Brief description	Hardware required	CP	O	D	PS	GQ	EU	V	
ARKANOID Discovery Software 163 Conduit St. Annapolis, MD 21401 (301) 268-9877 \$50 ©1987	In this computer version of the arcade hit of the same name, you control a small spacecraft that must defend itself from an anonymous captor. As in <i>Breakout</i> , you use a paddle and ball to hit the bricks. <i>Arkanoid</i> will appeal to arcade lovers of all ages. —ADAM SHERWIN	512K Amiga.	Y	★	★	★	★	A	★	★
BLOCKBUSTER Mindscape, Inc. 3444 Dundee Road Northbrook, IL 60062 (312) 480-7667 \$30-\$40 ©1987	All the fun of the arcade oldie <i>Breakout</i> —and then some! Use ingenious brick-bashing weaponry to make your way through 80 levels of multicolored, melodic, and high-speed fun. To top it off, you can design 48 levels of your own. Best with a fast, accurate joystick or mouse. —JEFF DONAHUE	Reviewed on 512K Atari ST. Also for 512K Amiga, C 64/128, 256K IBM PC. Joystick or mouse optional.	Y	★	★	★	★	A	★	★
LEGACY OF THE ANCIENTS Electronic Arts 1820 Gateway Drive San Mateo, CA 94404 (415) 571-7171 \$30 ©1987	A fine role-playing adventure that's the best intro to this popular genre I've seen. This single-character expedition to save Tarmalon from the evil warlords offers great graphics and sound, a variety of settings and play styles, and a smooth-as-silk play system. —ROBERT GEHORSAM	Reviewed on C 64/128. Also for 64K Apple. Joystick.	Y	★	★	★	★	E	★	★
LANE MASTODON VS. THE BLUBBERMEN Infocom, Inc. 125 CambridgePark Drive Cambridge, MA 02140 (617) 492-6000 \$12 ©1988	The first in Infocom's new comic-books-on-a-computer series, cleverly named Infocomics, is a sci-fi adventure that tells a story, but delivers little interactivity. Story line and graphics should appeal to young, male, devotees of comic books.† —ADAM SHERWIN	Reviewed on 256K IBM PC. Also for 128K Apple, C 64/128. CGA (IBM).	Y	★	N/A	N/A	★	A	★	★
TETRIS Spectrum HoloByte 2061 Challenger Drive Alameda, CA 94501 (415) 522-3584 \$25-\$35 ©1988	This arcade-like game comes to our country via the Soviet Union. It's simple, yet wildly addictive. A written description can't possibly do it justice: fit together shapes so that they fill up rows without leaving gaps. Demands patience and dexterity.† —JEFF DONAHUE	Reviewed on 256K IBM PC. Also for C 64/128.	Y	★	★	★	★	E	★	★
THUNDERCHOPPER ActionSoft Corp. 201 W. Springfield Ave. Champaign, IL 61820 (217) 398-8388 \$30 ©1987	Passable but relatively unsophisticated helicopter flight simulator, with unexciting graphics and sound. Missions are OK, but lack the feeling of being in the thick of the action. Actual simulation is fun, but the game can't compete with other helicopter simulators such as MicroProse's <i>Gunship</i> . —JAMES DELSON	Reviewed on C 64/128. Also for 64K Apple. Joystick recommended.	Y	★	★	★	★	A	★	★
THE TRAIN Accolade, Inc. 550 S. Winchester Blvd., #200 San Jose, CA 95128 (408) 985-1700 \$30-\$45 ©1987-1988	A great setting (occupied France during W.W. II) and a great plot (you must commandeer a Nazi train filled with plunder) can't hide the fact that this game has the depth of a postcard. It's marred by an unfair play system and limited replayability. —ROBERT GEHORSAM	Reviewed on C 64/128. Also for 512K Amiga, 256K IBM PC, 512K Macintosh. Joystick or mouse optional.	Y	★	★	★	★	E	★	★
RATINGS KEY O Overall performance; D Documentation; PS Play System; GQ Graphics Quality; EU Ease of Use; V Value for money; O Poor; ★ Average; ★★ Good; ★★★ Very Good; ★★★★ Excellent; N/A Not Applicable; E Easy; A Average; D Difficult; CP Copy Protected, yes or no; † Longer review follows chart										



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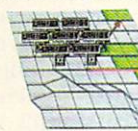
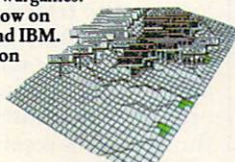
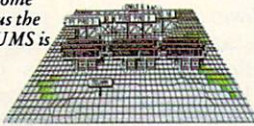
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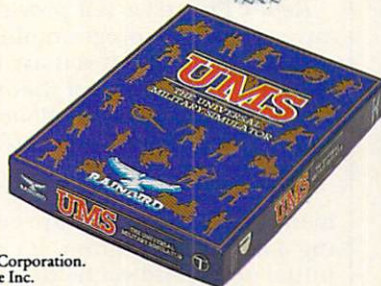
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SOFTWARE REVIEWS

On the following pages, you'll find in-depth reviews of some of the programs listed in the Software Guide. Refer back to the Guide on page 57 for information such as copy protection and addresses of software publishers.

BUSINESS & PRODUCTIVITY

Reflex Plus

HARDWARE REQUIREMENTS: 512K Macintosh

PUBLISHER: Borland International, (408) 438-8400

PRICE: \$279

OVERALL RATING: Excellent

Are you a Macintosh owner looking to buy a database? If so, you can choose among a world of options, from simple filing programs, often called "flat files," to relational database managers that incorporate their own programming languages. With a flat file, you'll have your database working in an afternoon. Before long, you're likely to have a dozen or so database files on disk—you'll almost need a separate file to keep track of your databases. And it also won't be long before you're likely to realize that a lot of the information in these various database files is redundant. Eventually, you may end up looking for a more powerful database.

If, on the other hand, you start out by acquiring the most powerful relational-database software on the market, you may not be able to get anything useful done with it because of its complexity and the high degree of expertise needed to run it.

I recommend an alternative: Take a look at *Reflex Plus*, which allows you to get started quickly, just as with a flat file, but has relational-database features available as your needs and expertise grow.

As a relational-database program, *Reflex Plus* can manage many files simultaneously, all with a logical relationship to one another. And it can juggle more than one file at a time, so it may appear that you are looking at a single record, but in fact the database program is taking information from different files and presenting this collection of pieces as one record.

Why would you want to manage more than one file at a time? Primarily to save time and disk space and to insure greater accuracy. A model use of a relational database,

such as *Reflex Plus*, would be in tracking customer orders. With a typical flat-file system, when an existing customer would call with an order, you would enter a record with the customer's name, address, the product number, description, price, quantity, and any other information pertinent to the order. When the customer calls again, you would have to reenter most of the same information. What you end up with over time is many records for one customer; you have wasted a great deal of time and disk storage. Also, every time the customer's information is entered, you introduce the possibility of making an error.

With a relational database, you would enter the customer's account number into the order file. *Reflex Plus* would then automatically go to the customer file, find the customer's standard information, and display it on your order form. It would only display the information, but would not place it in the order file.

When you enter the product number, *Reflex Plus* locates the product in the product file and displays the information. Again there is no redundancy, and you are able to verify if the product is in stock. If a customer changes any information, such as address or telephone number, the change is made in the customer file only. This updated record is then available to all data files that need customer information.

Reflex Plus provides this relational capability as an extremely powerful feature that's easy to use. It's as simple as defining a linking field in each of the files you want to link and drawing a line from one field to the other. Of course you should have logic to the relationship. For example, in the customer order illustration above, you might link the dollar amount of outstanding orders in the order file to the money-owed field in the accounts-receivable file.

Reflex Plus does not provide for any scripting or programming, as in *dBase III Plus*. So if you are looking for a database program that will allow you to create stand-alone applications for other people, you'll have to look beyond *Reflex Plus*.

Reflex Plus should top the lists of many Mac owners who are considering a database program. It can serve initial needs and yet be there with the power when your needs and creativity grow. Knowing that Borland International—a publisher with a

reputation for reliable and functional software at a fair price—is behind *Reflex Plus*, I am confident that the product will be enhanced over time.

—JOHN LEININGER

VP-Planner Plus

HARDWARE REQUIREMENTS: 384K IBM PC

PUBLISHER: Paperback Software International, (415) 644-2116

PRICE: \$180

OVERALL RATING: Excellent

VP-Planner Plus is an integrated spreadsheet program that shares many of the commands and features of Lotus 1-2-3. But, despite being touted as a 1-2-3 work-alike, *VP-Planner Plus* incorporates a number of extra features and enhancements that give the program a distinct advantage over 1-2-3. These features include a built-in text editor for advanced word processing and report generation and a unique multidimensional database facility.

Although inexperienced spreadsheet users may be overwhelmed by the number of commands and functions, those who are familiar with 1-2-3 will become proficient with *VP-Planner Plus* in minutes. It shares the same WKS file format as 1-2-3, version 1A, yet is also compatible with the most recent version of 1-2-3 (version 2.01, with the WK1 format).

VP-Planner Plus offers a number of functional differences that distinguish it from 1-2-3. Perhaps the most useful is the Tools Command, which provides sophisticated word-processing and report-generating capabilities. Using the built-in text editor, you can integrate text, graphs, and worksheet data on the same page to enhance the appearance of your printed documents.

In addition to creating standard two-dimensional row-and-column worksheets, *VP-Planner Plus* has an extremely powerful multidimensional database capability. With this unique facility, your worksheet can possess up to five dimensions, which let you construct sophisticated data structures. These multidimensional data configurations can store, retrieve, and consolidate information from literally hundreds of worksheets at the same time.

Aside from its extra features, *VP-Planner Plus* offers several enhancements that give it a still greater advantage over 1-2-3, such as a larger spreadsheet size (256 columns by 9,999 rows versus 1-2-3's 256 col-

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CIRCLE READER SERVICE 10



STATUS: G02
SCORE: 001500
H2TB: 100%



STATUS: G04
SCORE: 001500
H2TB: 100%



STATUS: G04
SCORE: 001500
H2TB: 100%



STATUS: G04
SCORE: 001500
H2TB: 100%



STATUS: G03
SCORE: 001500
H2TB: 100%



STATUS: G04
SCORE: 001500
H2TB: 100%

SOFTWARE REVIEWS

umns by 8,192 rows) and the ability to divide your worksheet into six independent display windows.

Despite all the powerful features and enhancements included in *VP-Planner Plus*, the program possesses some inherent disadvantages. Perhaps most significant, the program performs mathematical calculations more slowly than *1-2-3* does. For example, a worksheet that took 41 seconds to recalculate with *VP-Planner Plus* could be recalculated from inside *1-2-3* in 18 seconds—less than half the time. (Note: The publisher says that the new version 2 of *VP-Planner Plus* will calculate faster than *1-2-3*.)

Considering the number of additional features incorporated into the *VP-Planner Plus* package and its relatively low price (less than half that of *1-2-3*), it's easy to overlook the few negatives. In fact, because *VP-Planner Plus* allows you to perform a number of integrated options without having to exit the program, users who take advantage of these features can more than make up for any time lost during spreadsheet recalculation or modification. As a former *1-2-3* user, I highly recommend *VP-Planner Plus*. —ANTHONY GUARDINO

Webster's New World Outliner+

HARDWARE REQUIREMENTS: 256K IBM PC
PUBLISHER: Simon & Schuster Software, (212) 373-8882
PRICE: \$70
OVERALL RATING: Excellent

Organizing ideas is the first step of almost any project. Whether I'm planning a magazine article or a speech, I need to create an outline in the early stages of work. I've tried a number of outlining programs, but was never satisfied.

Webster's New World Outliner+ is a major exception. I approached the program with some skepticism, but soon discovered that it truly made it easier to structure my thoughts. After reading through the well-written manual, I installed the program on my hard-disk drive—essential if you want to get the most from this outliner—with no difficulties.

I was pleased that *Outliner+* could be run as either a stand-alone or memory-resident program. It can also be removed from memory after installation, freeing up the memory used by the program if it is needed. Other memory-resident programs should copy this feature.

When I called up the program while working with Microsoft Word, it opened a window on the screen. Each time I pressed the ENTER key, the program began a new heading. The TAB key created an indented entry. In a format similar to several other outliners, the program uses a plus sign to indicate that a heading in the outline has indented entries following it. A minus sign shows that there are no subheadings following an entry.

I created an outline, then tried out some of the program's other features, such as controlling how much of the outline was visible. Pressing a key on the number pad allowed me to expand or contract my view of the outline in the window.

I soon found that I could write whole paragraphs—not just headings and subheadings—while working with the outline. A press of the minus key on the numeric keypad let me see or hide my paragraphs. *Outliner+* marks paragraph entries with a standard paragraph sign.

Very few programs deliver more than they promise. *Outliner+* is a welcome exception, with two unexpected menu entries. The Desk menu includes a phone directory, address book, two calendars, and a to-do list function.

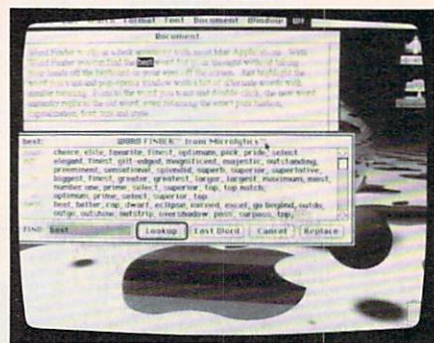
Under the Reference menu are several more useful features, including an area-code directory, worldwide time zone information, and conversion factors for weights and measures. There are also help screens for DOS commands and 13 popular programs, including Microsoft Word, GW BASIC, *dBase III*, and Lotus *1-2-3*. These extras alone make the program worth its \$70 price.

Outliner+ does have a few flaws. I discovered that calling up the program while I was using *Dr.Halo III* or Microsoft Word in its Hercules graphics mode scrambled the screen, which forced me to reboot. Also, if I clicked a mouse button while an *Outliner+* window was visible, the keyboard locked. Both of these problems are troublesome, but relatively easy to avoid.

Webster's New World Outliner+ is valuable and easy to learn, with flexible function-key commands that will make it even easier to use later. *Outliner+* is so valuable, in fact, that I've added the program's start-up command to my AUTOEXEC.BAT file so that it loads automatically when I boot. —GEORGE CAMPBELL

Word Finder

HARDWARE REQUIREMENTS: 256K IBM PC, 512K Macintosh
PUBLISHER: Microlytics, (716) 377-0130
PRICE: \$60
OVERALL RATING: Excellent



"It's at the tip of my tongue, but I just can't think of the right word." If this comment sounds like something you'd say, a thesaurus might help. But if you're like most people, you think that looking up words in a thesaurus is too much trouble.

The trouble is over, though, with *Word Finder*—an on-screen, desk accessory thesaurus that you can call up within any Macintosh application. (On MS-DOS computers, *Word Finder* is a memory-resident program, which also means you can call it up within most applications.)

Installing *Word Finder* is simple. Use Apple's *Font/DA Mover* utility to move it into the System file on your start-up or hard disk (a hard disk is recommended, but not required). Then, depending on the size of your disk space, copy either the large thesaurus (220,000 synonyms or 329K) or the small thesaurus (120,000 synonyms or 163K) into your System Folder. *Word Finder* works with MultiFinder and HyperCard stackware after an extra installation step.

Using *Word Finder* is equally easy. Double click on the word you want to replace, select *Word Finder* from the Apple menu (or use the keyboard equivalent), and a list of synonyms appears in a window. If there are too many words in the window to fit, you can scroll through the rest.

Words are grouped by part of speech (noun, verb, or adjective, for instance); and those that appear in boldface type have their own list of synonyms you can also choose. Change the original word in your text by clicking twice on the new word or by clicking on the Replace button. If needed, you can scroll through all the words you've looked

up so far in a writing session. If no synonyms exist for the word you're looking up, 24 words that are closest alphabetically will appear.

I'm usually not at a loss for words, but sometimes the exact word I need eludes me. And occasionally, a list of synonyms helps me find a nuance to explore that I hadn't considered.

So far, *Word Finder* works well for me. I could have said that it acts satisfactorily, functions acceptably, performs adequately, suffices unquestionably, or satisfies significantly. I guess I could get carried away; I have to use my judgment along with the word power that *Word Finder* offers. Also note *Word Finder's* limitations: Even with the large thesaurus, there'll be words without synonyms. For instance, "said" is not referenced, although "say" is. Or a common word such as "sky" is not referenced directly at all. And if you look up and replace a plural noun, such as "girls," you'll have to remember to add the "s" back to the replacement word.

But those drawbacks are basically minor. *Word Finder* offers many benefits for anyone who writes. And that's almost everyone.

—GWEN SOLOMON

EDUCATION & CREATIVITY

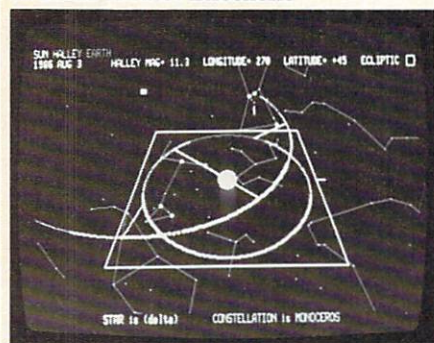
Solarsim

HARDWARE REQUIREMENTS: 128K IBM PC

PUBLISHER: Interstel, (713) 486-4163

PRICE: \$35

OVERALL RATING: Excellent



Would you like to turn your computer into a planetarium? Would you like to see a replica of the night sky, as it appeared on the night of your birth? Are you a student of astronomy or an astronomy buff? If you answered "yes" to any of these questions, read on.

Booting *Solarsim* is like having your own personal planetarium at your beck and call. *Solarsim* simulates the motion of the planets

around the sun, as well as the motion of asteroids or comets (including Halley's Comet). It displays a 3-D graphical representation of motion from any chosen point in space and shows the sky (planets, stars, and more) for a specific date, time, and location (longitude and latitude). With *Solarsim*, you can observe the positions of 800-plus stars so that you can identify them in the night sky. Another feature, which can be useful on starry summer nights, highlights the stars and draws the lines of familiar constellations. I have always enjoyed spotting Orion the hunter and the Big Dipper and Little Dipper in the sky. After spending some time with *Solarsim*, I look forward to spying some new stellar friends. Sky configurations can be saved for future reference, as well as printed.

The manual is thorough and can be a useful reference by itself. Included with the instructions and suggestions for operating the program is an appendix on "The Theory of *Solarsim*," complete with advanced mathematical formulas, a glossary, and a bibliography.

Solarsim is easy to use; however, do not confuse this program with a game simulation or introduction to the mysteries of the universe. *Solarsim* assumes previous knowledge of astronomy, with the manual reflecting this in its scientific and mathematical details. But, for those who fall into this category or plan to enter the circle of the solar system literate, *Solarsim* is a real find.

—JUDITH ZORNBERG

Stepping Stones, Levels I & II

HARDWARE REQUIREMENTS: 64K Apple,

256K IBM PC, 512K Macintosh

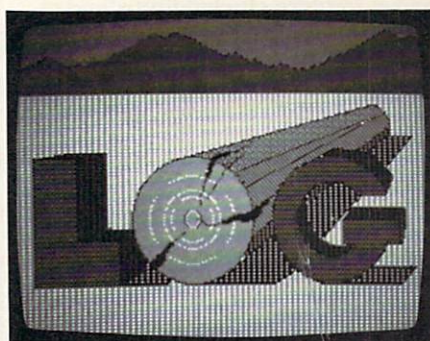
PUBLISHER: Compu-Teach, (203) 777-7738

PRICE: \$40 each

OVERALL RATING: Very Good

Using interesting graphics, animated scenes, and sounds, Compu-Teach's *Stepping Stones* series entertains youngsters as they learn. Each level in the series addresses a specific age group and focuses on teaching specific skills in three basic areas: reading, writing, and arithmetic. A strong point for both levels in the series is how they hold a child's interest while he or she learns.

Getting your enthusiastic preschooler to sit still for learning is no problem with *Stepping Stones Level*



I. Included is an introduction to letters, numbers, and words, which helps children master prereading skills in a creative way that lets even the youngest beginner find success.

The first module of this three-part program is *ABsCenes*. The main objective is to familiarize a 2-to-4 year old with letters. A child picks any letter on the keyboard, presses it, and an animated scene depicting that letter appears on-screen. Children vary developmentally at these ages, so the three games in *ABsCenes* build beautifully on one another. This allows your child to stay at his or her level, at first just enjoying the pictures, but eventually grasping the relationship to the letters and finally being able to match picture with letter.

ArithMatic: Counting, the second module, offers just as much involvement and learning for children who are beginning to recognize numbers. Counting skills can be grasped as your child progresses; even subtracting is creatively introduced. Emily, my 3-year-old, has difficulty counting more than three objects at a time, yet we had so much fun watching the helicopters fly off the screen that we were able to practice over and over again until Mommy was tired!

The third part, *Language: Word Pieces*, explores the concept of combining letters to make a word. Simple endings are provided, and children can put in a letter to make a word. When a word is formed, your child is rewarded with an animated picture of this word. For example, when "t" is added to "ar," a man's foot appears trying to get out of a patch of tar. While some preschoolers may not grasp the concept at first, this section is very well done and leaves room for the growth in word recognition and vocabulary.

Stepping Stones Level II builds on the skills presented in *Level I* as children work progressively and

SOFTWARE REVIEWS

move to more challenging steps in the three games of Pictionary, ArithMatic: Addition, and Sentence Wizard.

Pictionary is a reading game that uses extensive graphics and sound to help your child make the connection between familiar pictures and words. The object is to answer questions about a simple sentence with a fill-in-the-blank picture.

Practicing math facts in my household has often been frustrating. My 6-year-old couldn't remember an answer, and I didn't have enough fingers on my hands to demonstrate. ArithMatic: Addition is very effective in helping the child "see" that $7 + 6 = 13$, for example, by illustrating an addition problem with familiar objects. If after three attempts your child still hasn't answered correctly, the program patiently counts each object for the child to arrive at the answer.

Finally, Sentence Wizard helps children learn about making sentences. Subjects and verbs are left out of sentences; children fill in the blanks by selecting the appropriate word or picture. Eventually, children construct their own sentences by choosing from a list of subjects, verbs, prepositions, and objects. A sentence must make sense before it comes together with animation and fanfare.

Both *Stepping Stones* packages are brimming with learning experiences and the opportunity for positive interaction between parent and child. The results can mean achievement in reading, math, and early language skills that will help build confidence.

—DORIS ANDERSON

ENTERTAINMENT

Lane Mastodon vs. The Blubbermen

HARDWARE REQUIREMENTS: 128K Apple, C 64/128, 256K IBM PC

PUBLISHER: Infocom, (617) 492-6000

PRICE: \$12

OVERALL RATING: Very Good

ZZzap! A flash of light enters Earth's atmosphere, and instantly, thousands of household pets become gigantic chaos-causing monsters. So begins *Lane Mastodon vs. The Blubbermen*, the first of Infocom's new form of computer entertainment called "Infocomics," which are really computerized comic books.

With Infocomics, the story—



through animation and text—unfolds before your eyes. Unlike other types of computer entertainment, you don't control a character with a joystick or mouse; you watch and you read. But unlike ordinary print comics, these programs let you follow the story through different characters' perspectives. At certain points during the story, you can choose to either stay with your current character or follow another character's story line.

Lane Mastodon pits the blue-eyed, blond-haired superhero Lane Mastodon against the Blubbermen of Jupiter, a race whose only activity (besides eating!) is trying to eradicate all human life on Earth. *Lane Mastodon* is a good, enjoyable form of entertainment, particularly for preteens who read sci-fi comic books. Although this might surprise you, I think that the one drawback about Infocomics is the price. While \$12 is a great price for a computer game, it's pretty expensive for a comic book.

—ADAM SHERWIN

Tetris

HARDWARE REQUIREMENTS: C 64/128, 256K IBM PC

PUBLISHER: Spectrum HoloByte, (415) 522-3584

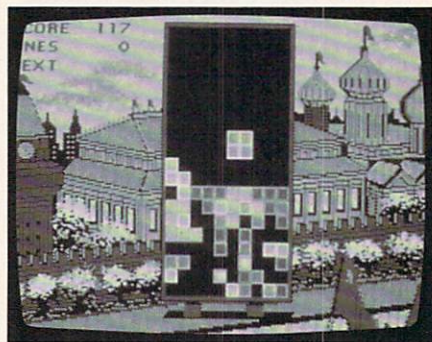
PRICE: \$25–\$35

OVERALL RATING: Excellent

I'm a bit irked by an omission on the *Tetris* box. I'm convinced that *Tetris* should be sold with a large, bright, orange sticker on the box proclaiming "WARNING: The enclosed disk contains one of the most frustrating, addictive, and delightful games you've ever come across." Without this sticker, the prospective buyer is caught completely off guard.

To be honest, *Tetris*, the brainchild of two Soviet programmers, is extremely simple. Yet, because it's such a visual thinking game, it's difficult to describe the objective. Let me try to explain: You must prevent

a steady stream of falling shapes from stacking up to the top of the screen. The blocks are I-shapes, L-shapes, T-shapes, and squares. As more and more of them fall, you must maneuver them so that they fill up empty rows, leaving no gaps. If you can accomplish this, all the squares in that row will disappear, and all the blocks stacked above will fall down one row. The closer to the top of the screen they get, the faster they appear to fall; so, ideally, you should continually fill up the bottom row. The key word is "ideally." It's just not that simple. Maybe your hand slips, or maybe you misjudge how two shapes should fit together



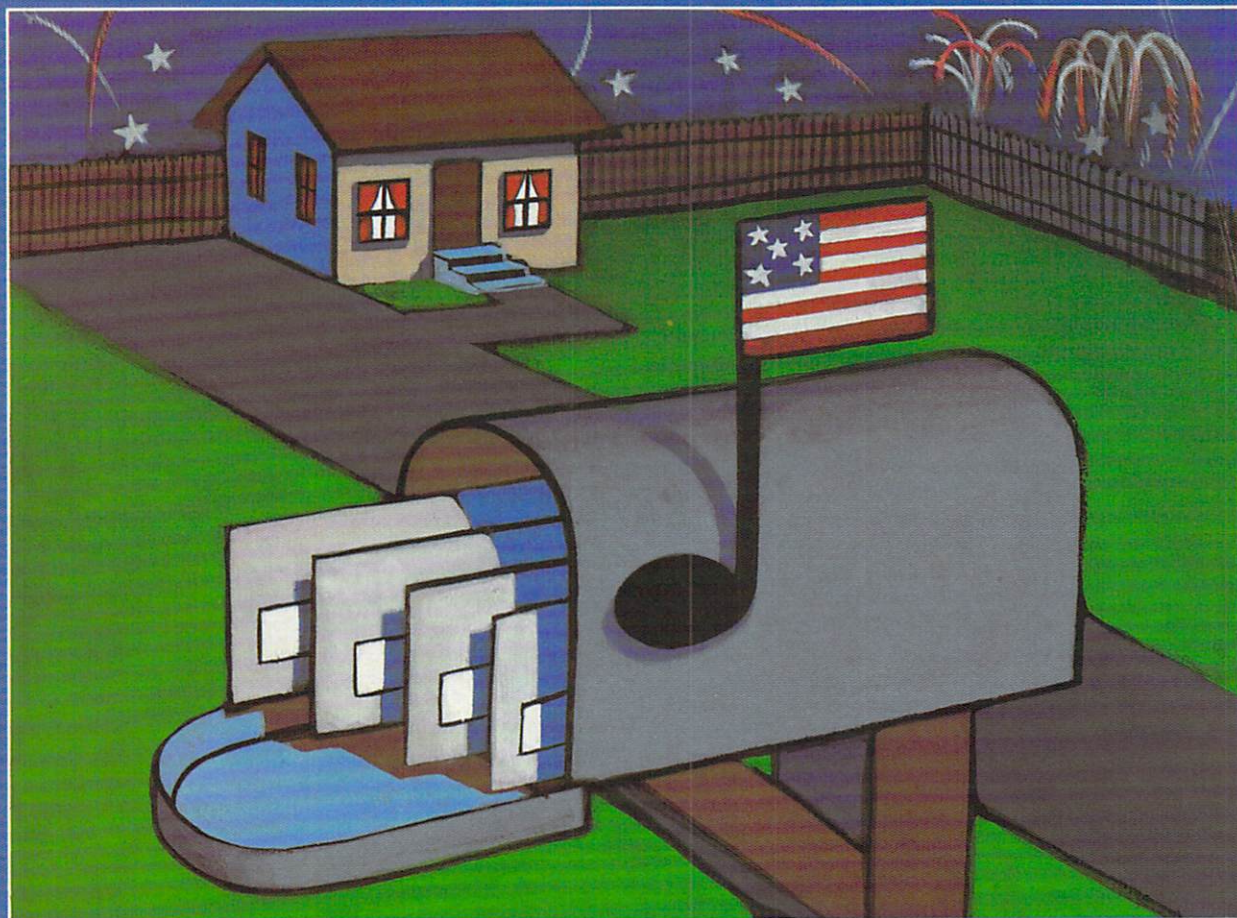
without leaving a gap. Whatever the reason, once those shapes start stacking up on top of each other, the sweat will start rolling down your forehead.

The controls are fabulously complicated. Pushing left on the joystick moves a shape left. Pushing right does the opposite. Pushing the fire button rotates a shape 45 degrees. And pulling down on the joystick drops the shape at a faster than normal speed. Keyboard controls are also available for the more nimble-fingered. Also built into the game are several helpful game play options; for instance, the preview option lets you see the next shape before it falls. Forewarned is forearmed. Other options adjust the difficulty level upward. As if that's what I needed.

Tetris is not for the easily frustrated, the clumsy, or the weak willed. You must be calm and use foresight and dexterity—and be able to rip yourself away from the game long enough to get some work done. The crafty designers, foreseeing the addictiveness of the game, included a "boss key." When your boss, co-workers, spouse, or kids come by, you merely press this button, and a mock spreadsheet instantly appears on-screen.

—JEFF DONAHUE

THE PROGRAMMER



C O N T E N T S A N D C O V E R A G E

FYI Page 75

Within "The Programmer," you'll find news for programmers and information about our programs.

PRODUCTIVITY Page 68

Breeze through mass mailings and much more with our *Mailing Labels* program.

MICROTONES Page 74

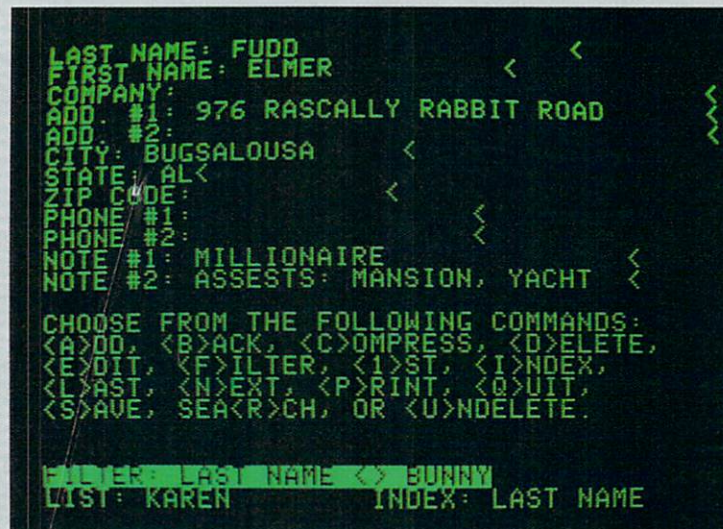
Get into the Fourth of July spirit with our version of *Grand Old Flag*.

Computers	Mailing Labels	Grand Old Flag
APPLE II/PLUS/e/GS	★ p	★
COMMODORE 64/128		★
IBM PC & COMPATIBLES	June 1988	★
TANDY 1000 EX/HX/SX/TX		★ T
KEY: ★ Program in this issue for this computer. p Printer optional. T Television or monitor with speaker required		

MAILING LABELS

Handle Mass Mailings—And More—With Ease

BY PASQUALE M. CIRULLO



EDITOR'S NOTE: Last month, we featured the IBM version of Mailing Labels. This month we present the Apple version.

Whether you're a small-business owner accumulating 500 names for a direct-mail campaign or are the custodian of your family's 50-name Christmas card list, *Mailing Labels* can make your job easier.

Even if you already own a database program, you may still find our program handy for what it does best: printing name-and-address labels in various formats, in any order, and from all or any part of your file. And, if you have no other database program, you'll find that *Mailing Labels* is flexible enough to serve as a Rolodex-type phone book.

You can print labels in alphabetical order for all of the names in your database . . . or, say, in numerical order, according to zip codes, for all customers who have unpaid balances.

To use *Mailing Labels*, type in the program in BASIC and SAVE it. Because of its length, you should be especially careful when typing and proofreading. When you are ready to use *Mailing Labels*, LOAD it into BASIC and RUN it.

Give the program a trial run first. Enter a half-dozen names and try all the functions. This way, if you've made any typing errors and the program doesn't work properly, you won't lose anything important.

USING MAILING LABELS

When you run the program, a menu with three choices will appear on the screen: <S>tart a new mailing list, <U>se an existing mailing list, and <E>xit the program. You can choose any option by pressing the first letter of that option.

<S>tart a new mailing list will allow you to create a new mailing list on your disk. You will first be asked for a name for the mailing list. This name can be up to ten characters long. If you choose a name that is already used, the computer will tell you and ask if you want to <O>verwrite the file or <L>oad the file. If you don't want to do either, press any other key, and you will return to the main menu. If you are unsure of what names you

have already used, enter a question mark (?) when you're asked for the name, and the computer will give you a catalog of all the names on any disk you specify. To specify a disk, type either D1 or D2 for the drive name. If you do not want to start a new file, just press RETURN when asked for a file name.

<U>se an existing mailing list will load a file from your disk and allow you to perform any of the functions to be described. Again, if you do not remember the names of your files, enter the question mark (?), and the computer will give you a catalog. If you do not want to load a file, just press RETURN when asked for the name.

<E>xit the program will return you to BASIC.

ENTERING NAMES

After you choose <S>tart a new mailing list, you will move to the Add screen, and the cursor will be at the Last Name field. Here you can type in Last Name, First Name, Company, a two-line street Address, City, State, Zip Code, two Phone numbers, and two Notes. Fill in the Last Name and any information you want, and then press RETURN to go on to the next person. (See "Using the Editor" for information on the keys you may use while adding names.)

The names can be added in any order, because the program automatically arranges them alphabetically by last name; you can change the order later (see <I>ndex command, right). You can enter up to 500 names into each mailing list file.

When you have finished adding names, press RETURN on a blank Last Name line, and the program will bring you to the Command Screen.

THE COMMAND SCREEN

If you choose <U>se an existing mailing list, the program bypasses the Add Screen and brings you directly to the Command Screen. The Command Screen displays the current record (a single person's name and other information). If you've marked this record for deletion, there will be a message stating so.

Below the record appears a list of all the commands that you may use. At the bottom of the screen is the name of the mailing list that you are working on and

the field (line) on which the list is indexed, or sorted. Also, if you have a filter set (see below on how to set a filter), it will also be displayed.

To choose a command, press the letter that appears in the angle brackets (< >). Here's an explanation of what each command does:

<A>dd. Allows you to add more names to the current list, in the same manner you did when you chose to <S>tart a new mailing list. (See "Using the Editor" for information on the keys you may use while adding names.)

ack. Displays the previous name in the list. If you are already at the first name or if there are no names before the current one that matches the filter (see <F>ilter below), the program beeps.

<C>ompress. Removes all the names that you have marked for deletion. This frees the space taken up by these names for use by others.

<D>elete. Marks a name for deletion. If you choose this command, the program will display a message at the top of the screen for that name saying "Marked for Deletion." However, the name isn't actually erased from the database until you choose <C>ompress. Until then, you can use the <U>ndelete command to restore the name.

<E>dit. Allows you to make changes to any line in the current record. It is used, for instance, if a person moves, and you want to change the information in his or her record. (See "Using the Editor" for information on the keys you may use while editing names.) If you change the information on the indexed line, the old record will be marked for deletion and a new record will be created. Otherwise, the changes are made to the current record.

<F>ilter. Allows you to look at or print certain names in the file based on a criterion that you establish. For instance, if you want to see only the names of people whose last names begin with A, B, C, D, or E, you can set a filter of Last Name < F. This will "filter out" all other names.

When you select <F>ilter, you will first be asked to either choose one of the 12 fields or Clear Filter. Clear Filter will erase any filter that was previously set and return you to the Command Screen.

After choosing the field, you must choose a relationship. The possible relationships are: = (equal to), <> (not equal to), < (less than), <= (less than or equal to), > (greater than), and >= (greater than or equal to). After a relationship is chosen, type in the filter string to complete the filter and press RETURN. The program will then print the filter at the bottom of each screen and only display those records that match the filter.

For example, to set up the previous example (Last Name < F), we would choose 1 (Last Name) for the field, 3 (<) for the relationship, and then type in F for the filter string and press RETURN. If you want the filter to check for a blank line (for instance, State =) just press RETURN for the relationship. If you decide you don't want a filter or have chosen the wrong field or relationship, press the ESC key.

<F>irst. Displays the first record in the mailing list.

<I>ndex. Changes the order in which the names are displayed or printed. For example, it allows you to switch from viewing in last name order to company name order. You can index on any of the lines. If you decide not to rearrange the file, either press RETURN or select the line on which the file is currently indexed.

<L>ast. Displays the last record in the list.

<N>ext. Displays the next record in the list. If you are already at the final name or if there are no names after

the current one that match the filter, the program beeps.

<P>rint. Lets you print the current name or all the records on mailing labels, envelopes, or plain paper. If a filter is in effect when you press P, the filter will remain in effect. For instance, if you want to print labels for only the people who live in New York State, you would set a filter for State = NY, and then go to the print section. (See "Printing Labels" for more information.)

<Q>uit. Saves the current list onto your disk and returns you to the original menu.

<S>ave. Saves the current list onto your disk.

<S>earch. Locates a particular name for you, based on the currently indexed field. For instance, if the list is indexed on Zip Code, you will not be able to search for a particular Company, only a particular Zip Code.

<U>ndelete lets you change your mind about deleting a record before you compress the list.

REMEMBER . . .

To minimize problems when saving or loading files, keep your mailing lists on a separate disk from your programs and from each other, and always keep a disk in your disk drive when using the program. Remove the disk only when you have exited the program.

Be sure to keep a backup copy of your files to minimize problems if something happens to them.

And, always leave the program through the <E>xit the program option of the initial menu, or some or all of your data may be lost.

USING THE EDITOR

Whenever you choose to <S>tart a new mailing list, <A>dd, or <E>dit, the program enters the Editor, and only certain keys will work.

The BACKSPACE key or CTRL-B deletes a character to the left of the cursor. To move the cursor from one line to another, use the UP-ARROW and DOWN-ARROW keys (not the RETURN key). You can also use CTRL-K to move up and CTRL-J to move down.

If you make an error in typing, you can move back and forth on the line by using the LEFT-ARROW and RIGHT-ARROW keys. You can also switch between Insert mode and Overtyping mode by pressing CTRL-I.

Finally, only use the RETURN key when you are finished entering the record and want to move to the next record. In Edit mode, pressing RETURN will redisplay the Command Screen.

PRINTING LABELS

When you choose <P>rint from the Command Screen, the program will go to the Print Screen. This screen is used to tell the computer the size of your mailing labels and how you want the labels printed.

First, you will be asked to describe the labels that you are using. Do this by telling the computer the number of Characters across, the number of Lines down, and the number of Labels across.

The number of Characters across is the number of characters from the first character of the first label to the first character of the next label on the same row. The number of Lines down is counted from the first line of a label to the first line of the next label below. The number of Labels across is the number of labels on one line across the width of the paper. The program will not allow more than 99 Characters across, 20 Lines down, and 4 Labels across. If you type 0 on any of the lines, the program will return you to the Command Screen.

Once you have entered valid numbers for the label

size, the program enters the Template Screen. Here is where you tell the computer how you want the labels printed. On the left side of the screen is a list of all the data lines or fields (Last Name and First Name, for instance) with numbers before them (these numbers represent these specific fields). You will use these numbers to lay out the label. On the right side of the screen is a list of letters, each one standing for one line on the label. To lay out the label, you type the number of the field you want printed on the appropriate line of the label. If you want to print more than one field on a single line of the label, the field numbers must be separated by a plus sign (+). You can also have a message or any other text printed on all the labels by typing that text on a label line. If you want a field or fields to print on the same line as your message, it must be separated from the message (and from other fields on the same line) by a plus sign.

You could print a label to look like this:

Attention: Wiley
Wiley Coyote
ACME Corp.
123 Desert Plains
Nowhere, CA 99999

The template would be typed in as follows:

a	
b	
c	Attention: +2
d	
e	2+ +1
f	3
g	4
h	6+, +7+ +8
i	
j	

Press RETURN on any line you want to remain blank. Pressing ESC at any time will abort the printing and return you to the Command Screen. If you make a mistake on a line, you will have to retype the label again. You cannot edit a line of the template.

After you type in the template, the program will show you how the current record will be printed and ask if it is correct. If it is not correct, the program will return to the Template screen for you to type in the label format again.

Once the label is correct, the program will ask you two questions: Do you want just the current name or all the names printed? and Do you want to start by printing the template? (You may want to say yes to this question in order to save the template for future reference.)

Once these questions have been answered, put the labels in your printer, and set it for the type size, style, and mode you want. (Depending on your printer, you may have to do this before running *Mailing Labels*; check your printer manual to find out how.) Press <Y> to begin printing. If you do not wish to print the labels at this time, press any key other than the <Y>.

```

90 NEXT X:SP$ = CHR$(32):BL$ = SP$:FOR X = 2 TO 39
100 BL$ = BL$+SP$:NEXT X:SG$ = "":FOR X = 1 TO 25
110 SG$ = SG$+CHR$(46):NEXT X:D$ = CHR$(4)
120 FS = "":G$ = CHR$(7):MD$(0) = "INSERT"+SP$+SP$
130 MD$(1) = "OVERTYPE":RS = CHR$(13)
140 ONERR GOTO 8500
150 ID = 1:DN = 1:SN = 1:N$ = -1:MM = -1:VT = FRE(0)
160 HOME:VTAB 4:HTAB 15:PRINT "WELCOME TO":VTAB 6
170 HTAB 10:PRINT "MAILING LIST MANAGER":PRINT
180 PRINT "DO YOU WANT TO...":PRINT
190 PRINT "<S>START A NEW MAILING LIST,"
200 PRINT "<U>USE AN EXISTING MAILING LIST, OR"
210 PRINT "<E>EXIT THE PROGRAM?"
220 GOSUB 9000:IF ZSS = "S" THEN 260
230 IF ZSS = "U" THEN 430
240 IF ZSS = "E" THEN 700
250 PRINT G$:GOTO 220
260 HOME:VTAB 6:HTAB 1:PRINT "ENTER NAME FOR NEW FILE"
270 INPUT "(WITHOUT EXTENSION): ";FS
280 IF FS = "" THEN 160
290 IF FS = "?" THEN GOSUB 9500:GOTO 260
300 IF LEN(FS) > 10 THEN FS = LEFT$(FS,10)
310 PRINT:PRINT D$;"UNLOCK ";FS;"SEQ"
320 VTAB 6:HTAB 1:PRINT "THIS FILE ALREADY EXISTS."
330 PRINT "DO YOU WANT TO <O>VERWRITE OR <L>OAD"
340 PRINT "THIS FILE.":GOSUB 9000:PRINT ZSS
350 IF ZSS <> "O" AND ZSS <> "L" THEN 160
360 IF ZSS = "L" THEN 470
370 FOR X = 1 TO 500:NIS$(X,1) = "":NIS$(X,2) = ""
380 P(X,1) = X+1:P(X,2) = 0:P(X,3) = 0:NEXT X
390 G = 1:P(500,1) = 0:SN = 1:ID = 1:NR = 0
400 GOSUB 10000:GOSUB 10500:GOSUB 11000
410 IF NR = 0 THEN PRINT:PRINT D$;"CLOSE":GOTO 150
420 GOTO 550
430 HOME:VTAB 6:HTAB 1:PRINT "ENTER FILENAME (WITHOUT"
440 INPUT "EXTENSION): ";FS:IF FS = "" THEN 150
450 IF FS = "?" THEN GOSUB 9500:GOTO 430
460 IF LEN(FS) > 10 THEN FS = LEFT$(FS,10)
470 HOME:VTAB 12:HTAB 8
480 PRINT "LOADING; PLEASE STAND BY."
490 MM = 0:PRINT:PRINT D$;"OPEN ";FS;"SEQ"
500 PRINT D$;"READ ";FS;"SEQ"
510 INPUT SN:INPUT ID:INPUT NR
520 FOR X = 1 TO 500:INPUT NIS$(X,1):INPUT NIS$(X,2)
530 FOR Y = 1 TO 3:INPUT P(X,Y):NEXT Y:NEXT X
540 PRINT D$;"CLOSE ";FS;"SEQ":GOSUB 10000
550 MM = 0:GOSUB 4000
560 GOSUB 10500:GOSUB 11500:VTAB 16:HTAB 1
570 PRINT "CHOOSE FROM THE FOLLOWING COMMANDS:"
580 PRINT "<A>DD, <B>ACK, <C>OMPRESS, <D>ELETE,"
590 PRINT "<E>DIT, <F>ILTER, <I>ST, <I>NDEX,"
600 PRINT "<L>AST, <N>EXT, <P>RINT, <Q>UIT,"
610 PRINT "<S>AVE, SEA<R>CH, OR <U>NDELETE."
620 GOSUB 9000
630 IF ZSS = "Q" THEN GOSUB 7000:PRINT D$;"CLOSE":GOTO
150
640 Z = 0:FOR X = 1 TO 14
650 IF MID$("ABCDEFGHIJLNPQRSU",X,1) = ZSS THEN Z = X:X =
14
660 NEXT X:IF Z = 0 THEN GOTO 620
670 ON Z GOSUB 1000,1500,2000,2500,3000,3500,4000,4500
,5000,5500,6000,7000,7500,8000
680 IF SN > NR THEN PRINT D$;"CLOSE":GOTO 370
690 GOTO 560
700 POKE 216,0:HOME:END
1000 NF = -1:GOSUB 10500:GOSUB 11000:REC = DN
1010 GOSUB 12000:RETURN
1500 D = DN
1510 Z = P(D,1):IF Z = 0 THEN Y = D:GOTO 1540
1520 IF P(Z,2) <> 0 THEN Z = P(Z,2):GOTO 1520
1530 GOTO 1570
1540 Z = P(Y,3)
1550 IF Z = 0 THEN REC = DN:GOSUB 12000:PRINT G$;:RETU
RN
1560 IF P(Z,1) = Y THEN Y = Z:GOTO 1540
1570 REC = Z:GOSUB 12000:GOSUB 12500

```

Apple II series/Mailing Labels

```

10 DIM CO(12),H(3),L(12,2),P(500,3),RO(12),CK$(7)
20 DIM FR$(6),H$(3),LB$(12),MD$(1),ML$(12),NIS$(500,2)
30 DIM PS$(3,20),PT$(5,20)
40 FOR X = 1 TO 12:RO(X) = X+2:READ L(X,1),L(X,2)
50 NEXT X:FOR X = 1 TO 12:READ LB$(X)
60 CO(X) = LEN(LB$(X))+2:NEXT X:FOR X = 1 TO 3
70 READ H$(X):NEXT X:FOR X = 1 TO 6:READ FR$(X)
80 NEXT X:FOR X = 1 TO 7:READ T:CK$(X) = CHR$(T)

```



```

1580 IF FF THEN DN = Z:RETURN
1590 D = Z:GOTO 1510
2000 GOSUB 13000:VTAB 17:HTAB 1
2010 PRINT "COMPRESSING; PLEASE STAND BY."
2020 FOR X = 1 TO NR:FOR Y = 1 TO 3:P(X,Y) = 0:NEXT Y
2030 NEXT X:VT = FRE(0):SN = 1
2040 FOR DN = 1 TO NR:X = SN
2050 IF NIS(DN,2) = "*" THEN 2080
2060 IF DN = SN THEN 2110
2070 GOSUB 14540:GOTO 2110
2080 IF DN = SN THEN SN = SN+1
2090 IF G = 0 THEN G = DN:GOTO 2110
2100 P(DN,1) = G:G = DN
2110 NEXT DN:GOSUB 4000:RETURN
2500 NIS(DN,2) = "*":RETURN
3000 GOSUB 13000:IF G <> 0 THEN 3040
3010 VTAB 17:HTAB 1:PRINT "THERE IS NO ROOM TO EDIT."
3020 PRINT "COMPRESS THE FILE BEFORE EDITING."
3030 GOSUB 13500:RETURN
3040 ZS$ = ML$(ID):GOSUB 14000
3050 IF ZS$ = ML$(ID) THEN 3080
3060 GOSUB 2500:DN = G:G = P(DN,1):GOSUB 8000
3070 GOSUB 14500:IF NR < DN THEN NR = DN
3080 REC = DN:GOSUB 15000:RETURN
3500 HOME:VTAB 2:HTAB 17:PRINT "FILTER"
3510 VTAB 4:HTAB 1:FOR X = 1 TO 12
3520 IF X < 10 THEN PRINT SP$;
3530 PRINT STR$(X);". ";LB$(X):NEXT X
3540 PRINT "13. CLEAR FILTER"
3550 PRINT:INPUT "SELECT: ";Z$:Z = VAL(Z$)
3560 IF Z < 1 OR Z > 12 THEN NF = -1:RETURN
3570 NF = 0:FI = Z:FOR X = 1 TO 6:VTAB 5+X:HTAB 28
3580 PRINT STR$(X);". ";FR$(X):NEXT X
3590 VTAB 13:HTAB 29:PRINT "SELECT: ";
3600 GOSUB 9000
3610 PRINT ZS$
3620 IF ZS$ < "1" OR ZS$ > "6" THEN NF = -1:RETURN

```

```

3630 FZ = VAL(ZS$):VTAB 20:HTAB 1
3640 PRINT LB$(FI);SP$;FR$(FZ);SP$;:INPUT "":FSS
3650 IF FSS = CHR$(27) THEN NF = -1:RETURN
3660 NM = 0:IF FSS = "" THEN FSS = LEFT$(BL$,L(FZ,1))
3670 HOME:GOSUB 4000:IF NOT NM THEN RETURN
3680 VTAB 12:HTAB 6
3690 PRINT "NO RECORDS MATCH THE FILTER."
3700 GOSUB 13500:NF = -1:NM = 0:GOTO 3670
4000 D = SN
4010 Z = P(D,1):IF Z <> 0 THEN D = Z:GOTO 4010
4020 Z = D:GOSUB 5560:RETURN
4500 HOME:VTAB 3:HTAB 18:PRINT "INDEX"
4510 FOR X = 1 TO 10:VTAB 5+X:HTAB 13
4520 IF X < 10 THEN PRINT SP$;
4530 PRINT STR$(X);". ";LB$(X):NEXT X:VTAB 17:HTAB 13
4540 INPUT "SELECT: ";Z$:Z = VAL(Z$)
4550 IF Z < 1 OR Z > 10 THEN RETURN
4560 HOME:VTAB 12:HTAB 7
4570 PRINT "INDEXING; PLEASE STAND BY."
4580 ID = Z:FOR X = 1 TO NR:REC = X:GOSUB 12000
4590 ZS$ = ML$(ID):GOSUB 15500:NIS(X,1) = TS$:NEXT X
4600 GOSUB 2020:RETURN
5000 D = SN
5010 Z = P(D,2):IF Z <> 0 THEN D = Z:GOTO 5010
5020 Z = D:GOSUB 1570:RETURN
5500 D = DN:NM = 0
5510 Z = P(D,2):IF Z = 0 THEN Y = D:GOTO 5540
5520 IF P(Z,1) <> 0 THEN Z = P(Z,1):GOTO 5520
5530 GOTO 5560
5540 Z = P(Y,3):IF Z = 0 THEN NM = -1:REC = DN:GOSUB 1
2000:PRINT GS$:RETURN
5550 IF P(Z,2) = Y THEN Y = Z:GOTO 5540
5560 REC = Z:GOSUB 12000:GOSUB 12500
5570 IF FF THEN DN = Z:RETURN
5580 D = Z:GOTO 5510
6000 HOME:PRINT "LABEL SIZE:":FOR X = 1 TO 3
6010 PRINT H$(X):NEXT X:FOR X = 1 TO 3

```

PART 2

"Find Red Square" Contest!

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TWA

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Next month we'll finish our tour of Paris and continue on to Germany.



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PRODUCTIVITY PROGRAM

```

6020 ZSS = "":LN = LEN(HSS(X)):VTAB 1+X:HTAB LN+1
6030 PRINT LEFT$(SG$,25-LN);
6040 GET K$
6050 IF (K$ < "0" OR K$ > "9") AND K$ <> R$ THEN 6040
6060 IF K$ = R$ THEN 6100
6070 ZSS = ZSS+K$:PRINT K$;
6080 IF LEN(ZSS) < 2 THEN 6040
6090 GOTO 6110
6100 IF LEN(ZSS) = 0 THEN ZSS = "0":VTAB 1+X:HTAB 26:P
PRINT ZSS
6110 VTAB 1+X:HTAB LN+1:PRINT SPC(25-LN)
6120 H(X) = VAL(ZSS):IF H(X) = 0 THEN X = 3
6130 NEXT X:IF ZSS = "0" THEN RETURN
6140 IF H(2) < 21 AND H(3) < 5 THEN 6170
6150 VTAB 10:HTAB 12:PRINT "INVALID NUMBERS!"
6160 GOSUB 13500:GOTO 6000
6170 HOME:PRINT TAB(16);"TEMPLATE":PRINT
6180 FOR X = 1 TO 12:IF X < 10 THEN PRINT SPS;
6190 PRINT X;". ";LB$(X):NEXT X
6200 FOR X = 1 TO H(2):VTAB 2+X:HTAB 20
6210 PRINT CHR$(X+96):NEXT X:FOR Y = 1 TO H(2)
6220 FOR X = 1 TO 5:PTS(X,Y) = "":NEXT X
6230 X = 1:Z = 0:TS = "":VTAB 2+Y:HTAB 21
6240 PRINT CHR$(16);SPC(18);:VTAB 2+Y:HTAB 22
6250 GET K$
6260 IF K$ <> R$ AND K$ <> E$ AND K$ < SPS THEN 6250
6270 IF K$ = E$ THEN Y = H(2):GOTO 6350
6280 IF K$ = R$ THEN PTS(X,Y) = TS:X = 5:GOTO 6330
6290 Z = Z+1:IF Z > 18 THEN X = 5:GOTO 6320
6300 PRINT K$;
6310 IF ASC(K$) <> 43 THEN TS = TS+K$:GOTO 6250
6320 PTS(X,Y) = TS:TS = ""
6330 IF VAL(PTS(X,Y)) > 12 THEN PRINT G$;:GOTO 6220
6340 X = X+1:IF X < 6 THEN 6250
6350 VTAB 2+Y:HTAB 21:PRINT SPS;:NEXT Y
6360 IF K$ = E$ THEN RETURN
6370 X = 1:GOSUB 16000:HOME:FOR Y = 1 TO H(2)
6380 PRINT PSS(1,Y):NEXT Y:PRINT
6390 PRINT "IS THIS CORRECT?":GOSUB 9000:HOME
6400 IF ZSS <> "Y" THEN 6170
6410 VTAB 5:HTAB 1
6420 PRINT "PRESS <Y> TO PRINT ONLY THE CURRENT"
6430 PRINT "RECORD OR ANY OTHER KEY TO PRINT ALL"
6440 PRINT "THE RECORDS. ":GOSUB 9000:PRINT ZSS
6450 CH$ = ZSS:VTAB 11:HTAB 1
6460 PRINT "PRESS <Y> TO PRINT THE TEMPLATE"
6470 PRINT "OR ANY OTHER KEY TO CONTINUE. ";
6480 GOSUB 9000:PRINT ZSS:TP$ = ZSS:VTAB 16:HTAB 1
6490 PRINT "PRESS <Y> WHEN THE PRINTER IS READY"
6500 PRINT "OR ANY OTHER KEY TO ABORT PRINTING. ";
6510 GOSUB 9000:PRINT ZSS:IF ZSS <> "Y" THEN RETURN
6520 PRINT:PRINT D$;"PR#1":IF TP$ <> "Y" THEN 6580
6530 FOR Y = 1 TO H(2):ZSS = "":FOR X = 1 TO 5
6540 IF PTS(X,Y) = "" THEN 6570
6550 IF X <> 1 THEN ZSS = ZSS+" "
6560 ZSS = ZSS+PTS(X,Y)
6570 NEXT X:PRINT ZSS:NEXT Y
6580 IF CH$ = "Y" THEN FOR Y = 1 TO H(2):PRINT PSS(1,Y)
:NEXT Y:PRINT D$;"PR#0":RETURN
6590 GOSUB 4000
6600 FOR X = 1 TO H(3):GOSUB 16000:GOSUB 5500
6610 IF NM THEN X = H(3)
6620 NEXT X:FOR Y = 1 TO H(2):FOR X = 1 TO H(3)
6630 PRINT PSS(X,Y);SPC(H(1)-LEN(PSS(X,Y)));
6640 PSS(X,Y) = "":NEXT X:PRINT:NEXT Y
6650 IF NM THEN PRINT D$;"PR#0":GOSUB 4000:RETURN
6660 GOTO 6000
7000 GOSUB 13000:VTAB 17:HTAB 1
7010 PRINT "SAVING, PLEASE STAND BY."
7020 PRINT:PRINT D$;"CLOSE"
7030 PRINT D$;"OPEN ";FS$;"SEQ"
7040 PRINT D$;"WRITE ";FS$;"SEQ"
7050 PRINT SN:PRINT G:PRINT ID:PRINT NR
7060 FOR X = 1 TO 500:PRINT NI$(X,1):PRINT NI$(X,2)
7070 FOR Y = 1 TO 3:PRINT P(X,Y):NEXT Y:NEXT X
7080 PRINT D$;"CLOSE ";FS$;"SEQ":GOSUB 10000:RETURN

```

```

7500 GOSUB 13000:D = SN:VTAB 17:HTAB 1
7510 PRINT "WHAT ";LB$(IN);" DO YOU WANT TO"
7520 INPUT "SEARCH FOR? ";Z$
7530 IF ZSS = "" THEN RETURN
7540 GOSUB 15500
7550 IF TS = LEFT$(NI$(D,1),LEN(TS)) THEN DN = D:REC =
DN:GOSUB 12000:RETURN
7560 IF TS < LEFT$(NI$(D,1),LEN(TS)) THEN D = P(D,1):G
OTO 7580
7570 D = P(D,2)
7580 IF D <> 0 THEN 7550
7590 GOSUB 13000:VTAB 17:HTAB 1
7600 PRINT "SORRY, CAN'T FIND THAT ";LB$(ID);"."
7610 GOSUB 13500:RETURN
8000 NI$(DN,2) = "":RETURN
8500 ER = PEEK(222):EL = PEEK(218)+PEEK(219)*256
8510 IF MM AND ER = 6 THEN 370
8520 PRINT "YOU HAVE ERROR NUMBER ";ER;" IN LINE ";EL;
"."
8530 PRINT D$;"CLOSE":IF ER <> 6 THEN 8550
8540 PRINT "I COULD NOT FIND THE FILE.":GOTO 8610
8550 IF ER <> 9 THEN 8590
8560 PRINT "THE DISK IS FULL. YOU MUST EXIT"
8570 PRINT "AND COPY THIS LIST TO A NEW DISK."
8580 GOTO 8610
8590 PRINT "PLEASE CHECK YOUR BASIC MANUAL FOR"
8600 PRINT "FURTHER EXPLANATION."
8610 GOSUB 13500:GOTO 150
9000 Z = PEEK(-16384)-128:IF Z < 0 THEN 9000
9010 POKE -16368,0:ZSS = CHR$(Z-32*(Z > 96)*(Z < 123))
9020 RETURN
9500 HOME:VTAB 6:HTAB 1
9510 INPUT "WHAT DRIVE ARE THE FILES IN? ";DR$
9520 IF DR$ = "" THEN HOME:PRINT D$;"CATALOG":PRINT:GO
SUB 13500:RETURN
9530 IF LEFT$(DR$,1) <> ":", THEN DR$ = ":"+DR$
9540 HOME:PRINT D$;"CATALOG, ";DR$:PRINT:GOSUB 13500
9550 RETURN
10000 PRINT:PRINT D$;"OPEN ";FS$;"RAF,L233":RETURN
10500 HOME:VTAB 24:HTAB 1:PRINT "LIST: ";FS;
10510 VTAB 24:HTAB 20:PRINT "INDEX: ";LB$(ID);
10520 IF NF THEN RETURN
10530 VTAB 23:HTAB 1:INVERSE
10540 PRINT "FILTER: ";LB$(FI);SPS;FR$(FZ);SPS;FSS;
10550 NORMAL:RETURN
11000 VTAB 18:HTAB 1
11010 PRINT "LEAVE THE LAST NAME LINE BLANK WHEN"
11020 PRINT "YOU HAVE NO MORE NAMES TO ADD."
11030 IF G <> 0 THEN 11090
11040 HOME:VTAB 6:HTAB 1
11050 PRINT "YOU HAVE REACHED THE LIMIT FOR THIS"
11060 PRINT "LIST. IF YOU HAVE MORE NAMES TO ADD,"
11070 PRINT "START A NEW LIST.":GOSUB 13500
11080 GOSUB 7000:RETURN
11090 FOR X = 1 TO 12:ML$(X) = LEFT$(BL$,L(X,1))
11100 NEXT X:GOSUB 11500:GOSUB 14000
11110 IF ML$(1) = LEFT$(BL$,20) THEN RETURN
11120 DN = G:G = P(DN,1):NI$(DN,2) = ""
11130 IF NR < DN THEN NR = DN
11140 GOSUB 14500:REC = DN:GOSUB 15000:GOTO 11030
11500 FOR X = 1 TO 12:VTAB RO(X):HTAB 1
11510 PRINT LB$(X);": ";ML$(X);"<":NEXT X
11520 IF NI$(DN,2) <> "*" THEN RETURN
11530 VTAB 2:HTAB 1:FLASH:PRINT "MARKED FOR DELETION."
11540 NORMAL:RETURN
12000 VTAB 20:HTAB 1:PRINT:PRINT D$;"READ ";FS$;"RAF,R
";REC
12010 INPUT RF$:PRINT D$
12020 FOR Y = 1 TO 12:ML$(Y) = MID$(RF$,L(Y,2),L(Y,1))
12030 NEXT Y:RETURN
12500 FF = 0:IF NF THEN FF = -1:RETURN
12510 ZSS = LEFT$(ML$(FI),LEN(FSS))
12520 IF (ZSS < FSS AND (FZ > 1 AND FZ < 5)) OR (ZSS =
FSS AND (FZ = 1 OR FZ = 4 OR FZ = 6)) OR (ZSS > FSS A
ND (FZ = 2 OR FZ = 5 OR FZ = 6)) THEN FF = -1
12530 RETURN

```



```

13000 VTAB 16:HTAB 1:FOR X = 16 TO 20:PRINT BL$:NEXT X
13010 RETURN
13500 PRINT:PRINT TAB(7);"PRESS ANY KEY TO CONTINUE."
13510 GOSUB 9000:RETURN
14000 CY = 1:MF = 0
14010 VTAB 21:HTAB 1:PRINT "MODE: ";MD$(MF)
14020 TS = ML$(CY):CX = 1
14030 VTAB RO(CY):HTAB CO(CY)+CX
14040 GET K$:DK = 0:FOR L = 1 TO 7
14050 IF K$ = CK$(L) THEN DK = L:L = 7
14060 NEXT L:IF DK = 0 THEN 14180
14070 ON DK GOTO 14080,14080,14100,14100,14120,14120,1
4160
14080 DX = (DK = 2)-(DK = 1):IF (CX = 1 AND DX = -1) O
R (CX = L(CY,1) AND DX = 1) THEN PRINT G$;:GOTO 14030
14090 CX = CX+DX:GOTO 14030
14100 ML$(CY) = TS:CY = CY+(DK = 4)-(DK = 3)
14110 CY = CY+((CY = 0)-(CY = 13))*10:GOTO 14020
14120 IF CX = 1 THEN PRINT G$;:GOTO 14030
14130 IF CX = 2 THEN TS = MID$(TS,CX)+SP$:GOTO 14150
14140 TS = LEFT$(TS,CX-2)+MID$(TS,CX)+SP$
14150 CX = CX-1:GOTO 14260
14160 MF = NOT MF:VTAB 21
14170 HTAB 7:PRINT MD$(MF):GOTO 14030
14180 IF K$ = CHR$(13) THEN ML$(CY) = TS:RETURN
14190 IF K$ < SP$ OR CX > L(CY,1) THEN PRINT G$;:GOTO
14030
14200 IF NOT MF THEN 14230
14210 IF CX = 1 THEN TS = K$+MID$(TS,2):GOTO 14250
14220 TS = LEFT$(TS,CX-1)+K$+MID$(TS,CX+1):GOTO 14250
14230 IF CX = 1 THEN TS = K$+LEFT$(TS,L(CY,1)-1):GOTO
14250
14240 TS = LEFT$(TS,CX-1)+K$+MID$(TS,CX,L(CY,1)-CX)
14250 CX = CX+1:CX = CX-(CX = L(CY,1)+1)
14260 VTAB RO(CY):HTAB CO(CY)+1:PRINT TS:GOTO 14030
14500 ZSS = ML$(ID):GOSUB 15500:NIS$(DN,1) = TS
14510 P(DN,1) = 0:P(DN,2) = 0:P(DN,3) = 0
14520 IF NR = 1 THEN RETURN
14530 X = 1
14540 IF NIS$(DN,1) < NIS$(X,1) THEN 14570
14550 Z = P(X,2):IF Z = 0 THEN P(X,2) = DN:P(DN,3) = X
:RETURN
14560 X = Z:GOTO 14540
14570 Z = P(X,1):IF Z = 0 THEN P(X,1) = DN:P(DN,3) = X
:RETURN
14580 X = Z:GOTO 14540
15000 RF$ = "":FOR Y = 1 TO 12:RF$ = RF$+ML$(Y):NEXT Y
15010 PRINT
15020 PRINT D$;"WRITE ";F$;"RAF,R";REC
15030 PRINT RF$:PRINT D$:RETURN
15500 TS = "":FOR Y = 1 TO LEN(ZSS)
15510 Z = ASC(MID$(ZSS,Y,1))
15520 TS = TS+CHR$(Z-32*(Z > 96)*(Z < 123))
15530 NEXT Y:RETURN
16000 FOR Z = 1 TO H(2):PSS$(X,Z) = "":FOR V = 1 TO 5
16010 IF VAL(PT$(V,Z)) = 0 THEN PSS$(X,Z) = PSS$(X,Z)+PT
$(V,Z):GOTO 16060
16020 ZSS = ML$(VAL(PT$(V,Z)))
16030 FOR Y = LEN(ZSS) TO 1 STEP -1
16040 IF MID$(ZSS,Y,1) <> SP$ THEN PSS$(X,Z) = PSS$(X,Z)
+LEFT$(ZSS,Y):Y = 1
16050 NEXT Y
16060 NEXT V:IF LEN(PSS$(X,Z)) > H(1) THEN PSS$(X,Z) = L
EFT$(PSS$(X,Z),H(1))
16070 NEXT Z:RETURN
16500 DATA 20,1,15,21,30,36,30,66,30,96,15,126
16510 DATA 2,141,10,143,15,153,15,168,25,183,25,208
17000 DATA LAST NAME,FIRST NAME,COMPANY,ADD. #1
17010 DATA ADD. #2,CITY,STATE,ZIP CODE,PHONE #1
17020 DATA PHONE #2,NOTE #1,NOTE #2
17500 DATA " CHARACTERS ACROSS"
17510 DATA " LINES DOWN",LABELS ACROSS
18000 DATA =,<,>,<=>,>=>
18500 DATA 8,21,11,10,2,127,9

```

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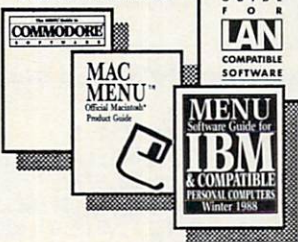
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GRAND OLD FLAG

BY JOEY LATIMER

When Francis Scott Key wrote the poem that became "The Star-Spangled Banner," our flag had 15 stars and 15 stripes (representing the original 13 states, plus Vermont and Kentucky.) Over the years, other songs were inspired by our flag. One of the most popular is "You're a Grand Old Flag" by George M. Cohan. I call my Microtones adaptation of this classic, *Grand Old Flag*. Just



type in the program in BASIC, SAVE it, and then RUN it. It's sure to put you in a patriotic mood! And, don't forget to hang out your flag this year!

Apple II series/Grand Old Flag

```
10 DIM P(76),D(76)
20 HOME:VTAB 12:HTAB 6
30 PRINT "★ YOU'RE A GRAND OLD FLAG ★"
40 PRINT:PRINT TAB(10);"BY GEORGE M. COHAN"
50 FOR X = 1 TO 76:READ P(X),D(X):NEXT X
60 FOR X = 0 TO 36:READ A:POKE 768+X,A:NEXT X
70 FOR X = 1 TO 76:POKE 6,21*D(X):POKE 8,P(X)*2
80 CALL 768:NEXT X:GOTO 70
1000 DATA 53,3,64,1,81,4,81,4,96,2,108,2,81,2
1010 DATA 72,4,85,2,81,4,96,2,108,2,81,4,96,2,108,2
1020 DATA 81,4,96,2,108,2,85,12,108,2,96,2,85,4,81,4
1030 DATA 72,6,108,2,81,4,72,4,64,6,81,2,72,2,64,4
1040 DATA 81,2,72,2,64,4,81,2,72,10,0,2,53,3,64,1
1050 DATA 81,4,81,4,81,4,96,2,108,2,81,2,72,4,85,2
1060 DATA 81,4,85,2,91,2,96,4,76,2,64,2,96,4,64,4
1070 DATA 72,10,0,2,108,2,108,2,81,6,85,2,81,4,64,4
1080 DATA 72,6,76,2,72,4,85,2,108,2,96,2,81,4,96,2
1090 DATA 81,4,85,4,81,10,0,2
2000 DATA 165,8,201,2,176,2,169,2,74,133,10,164,8
2010 DATA 240,8,173,48,192,234,234,136,208,251,56
2020 DATA 165,7,229,10,133,7,176,235,198,6,208,231,96
```

Commodore 64 & 128 (C 64 mode)/Grand Old Flag

```
10 DIM V1(79,3),V2(103,3),V3(107,3)
20 S=54272:FOR I=0 TO 23:POKE S+I,0:NEXT I
30 POKE S+24,15:POKE S+5,31:POKE S+6,241:POKE S+12,31
40 POKE S+13,177:POKE S+19,31:POKE S+20,177
50 FOR X=1 TO 79:READ V1(X,1),V1(X,2),V1(X,3):NEXT X
60 FOR X=1 TO 103:READ V2(X,1),V2(X,2),V2(X,3):NEXT X
70 FOR X=1 TO 106:READ V3(X,1),V3(X,2),V3(X,3):NEXT X
80 POKE 53280!,2:PRINT CHR$(147)
90 POKE 214,10:PRINT CHR$(5)
100 PRINT TAB(7);"★ YOU'RE A GRAND OLD FLAG ★"
110 PRINT:PRINT TAB(11);"BY GEORGE M. COHAN"
120 P1=1:P2=1:P3=1:T1=0:T2=0:T3=0
130 POKE S+1,V1(P1,1):POKE S,V1(P1,2):POKE S+4,33
140 POKE S+8,V2(P2,1):POKE S+7,V2(P2,2):POKE S+11,33
150 POKE S+15,V3(P3,1):POKE S+14,V3(P3,2):POKE S+18,33
160 T1=T1+1:IF T1=V1(P1,3) THEN T1=0:P1=P1+1:POKE S+4,32
170 T2=T2+1:IF T2=V2(P2,3) THEN T2=0:P2=P2+1:POKE S+11,32
```

```
180 T3=T3+1:IF T3=V3(P3,3) THEN T3=0:P3=P3+1:POKE S+18,32
190 IF P1<80 THEN 130
200 GOTO 120
1000 DATA 37,162,3,31,165,1,25,30,4,25,30,4,25,30,4
1010 DATA 21,31,2,18,209,2,25,30,2,28,49,4,23,181,2
1020 DATA 25,30,4,21,31,2,18,209,2,25,30,4,21,31,2
1030 DATA 18,209,2,25,30,4,21,31,2,18,209,2,23,181,12
1040 DATA 18,209,2,21,31,2,23,181,4,25,30,4
1050 DATA 28,49,6,18,209,2,25,30,4,28,49,4,31,165,6
1060 DATA 25,30,2,28,49,2,31,165,4,25,30,2,28,49,2
1070 DATA 31,165,4,25,30,2,28,49,8,28,49,2,0,0,2
1080 DATA 37,162,3,31,165,1,25,30,4,25,30,4,25,30,4
1090 DATA 21,31,2,18,209,2,25,30,2,28,49,4,23,181,2
1100 DATA 25,30,4,23,181,2,22,96,2,21,31,4,26,156,2
1110 DATA 31,165,2,21,31,4,25,30,2,28,49,8,28,49,2
1120 DATA 0,0,2,18,209,2,18,209,2,25,30,6,23,181,2
1130 DATA 25,30,4,31,165,4,28,49,6,26,156,2,28,49,4
1140 DATA 23,181,2,18,209,2,21,31,2,25,30,4,21,31,2
1150 DATA 25,30,4,23,181,4,25,30,8,18,209,2,0,0,2
2000 DATA 14,24,4,12,143,2,0,0,2,16,195,4,12,143,2
2010 DATA 0,0,2,18,209,4,12,143,2,0,0,2,18,209,2
2020 DATA 15,210,2,12,143,2,0,0,2,18,209,4,12,143,2
2030 DATA 0,0,2,18,209,4,12,143,2,0,0,2,13,78,4
2040 DATA 18,209,2,18,209,1,21,31,1,18,209,2,14,24,2
2050 DATA 18,209,2,9,104,2,18,209,2,18,209,2,18,209,4
2060 DATA 21,31,4,23,181,2,18,209,2,21,31,2,23,181,2
2070 DATA 12,143,4,11,218,4,10,143,2,0,0,2,10,143,2
2080 DATA 21,31,2,14,24,2,0,0,2,21,31,2,0,0,2,14,24,2
2090 DATA 0,0,2,21,31,2,19,239,2,18,209,2,21,31,4
2100 DATA 22,96,2,23,181,2,0,0,2,18,209,4,12,143,2
2110 DATA 0,0,2,16,195,4,12,143,2,0,0,2,18,209,4
2120 DATA 12,143,2,0,0,2,18,209,2,0,0,2,12,143,2,0,0,2
2130 DATA 18,209,4,13,78,4,21,31,4,15,210,4,21,31,4
2140 DATA 14,24,2,21,31,1,22,96,1,21,31,2,16,195,2
2150 DATA 14,24,2,0,0,2,9,104,2,9,104,2,12,143,6
2160 DATA 11,218,2,12,143,4,15,210,4,14,24,6,13,78,2
2170 DATA 14,24,4,18,209,4,12,143,2,14,24,4,14,24,2
2180 DATA 21,31,2,19,239,2,18,209,2,9,104,2,12,143,2
2190 DATA 18,209,1,17,195,1,18,209,2,21,31,2,25,30,2
2200 DATA 0,0,2
3000 DATA 18,209,3,31,165,1,18,209,4,18,209,4,15,210,4
3010 DATA 14,24,2,12,143,2,15,210,2,9,104,4,15,210,2
3020 DATA 0,0,2,15,210,2,16,195,2,16,195,2,0,0,2
3030 DATA 15,210,2,16,195,2,16,195,2,0,0,2,15,210,2
3040 DATA 15,210,2,15,210,2,16,195,12,16,195,2
3050 DATA 16,195,2,0,0,2,16,195,2,0,0,2,16,195,2,0,0,2
3060 DATA 16,195,2,16,195,2,16,195,2,0,0,2,15,210,2
3070 DATA 0,0,2,19,239,2,0,0,2,21,31,4,15,210,2
3080 DATA 25,30,2,25,30,4,16,195,2,25,30,2,25,30,4
3090 DATA 16,195,2,23,181,2,16,195,4,16,195,2,16,195,2
3100 DATA 0,0,2,23,181,4,0,0,2,15,210,2,0,0,2,21,31,2
3110 DATA 0,0,2,15,210,2,16,195,2,16,195,2,15,210,2
3120 DATA 15,210,4,15,210,2,0,0,2,15,210,2,15,210,2
3130 DATA 15,210,2,0,0,2,15,210,2,15,210,2,18,209,2
3140 DATA 0,0,2,13,78,2,0,0,2,18,209,2,16,195,8
3150 DATA 16,195,2,0,0,2,23,181,4,0,0,2,15,210,1
3160 DATA 15,210,1,15,210,2,0,0,4,15,210,2
3170 DATA 0,0,2,25,30,2,0,0,2,23,181,1,23,181,1
3180 DATA 18,209,2,0,0,2,0,0,2,18,209,2,16,195,2
3190 DATA 16,195,2,17,195,2,17,195,4,17,195,2
3200 DATA 16,195,4,16,195,4,15,210,2,9,104,1,8,225,1
3210 DATA 9,104,2,10,143,2,15,210,2,0,0,2
```

IBM PC & compatibles*/Grand Old Flag

```
10 DIM A$(7):KEY OFF:CLS
20 LOCATE 10,6:PRINT "★--YOU'RE A GRAND OLD FLAG--★"
30 PRINT:PRINT TAB(12);"by George M. Cohan"
40 FOR X=1 TO 7:READ A$(X):NEXT X
50 FOR X=1 TO 7:PLAY A$(X):NEXT X:GOTO 50
1000 DATA "T12003L4D8.<B16GGGE8D8G8AF#8GE8D8"
1010 DATA "GE8D8GE8D8F#2.D8E8F#G"
1020 DATA "A.D8GAB.68A8BG8A8BG8"
1030 DATA "MLA2A8MNP8>D8.<B16GGGE8D8G8AF#8"
```



```
1040 DATA "GF#8F8EG#8B8EBMLA2A8MNP8D8D8"
1050 DATA "G.F#8GBA.G#8AF#8D8E8GE8"
1060 DATA "GF#MLG2G8MNP8"
```

*IBM PCjr owners should use the Tandy 1000 series version.

Tandy 1000 series/Grand Old Flag

```
10 DIM A$(7),B$(7),C$(7):SOUND ON:WIDTH 40:KEY OFF:CLS
20 LOCATE 10,6,0:PRINT "--YOU'RE A GRAND OLD FLAG--"
30 PRINT:PRINT TAB(12);"by George M. Cohan"
40 FOR X=1 TO 7:READ A$(X):NEXT X
50 FOR X=1 TO 7:READ B$(X):NEXT X
60 FOR X=1 TO 7:READ C$(X):NEXT X
70 FOR X=1 TO 7:PLAY A$(X),B$(X),C$(X)
80 FOR DE=1 TO 20:NEXT DE,X:GOTO 70
1000 DATA "V15T12003MBL4D8.<B16GGGE8D8G8AF#8GE8D8"
1010 DATA "GE8D8GE8D8F#2.D8E8F#G"
1020 DATA "A.D8GAB.G8A8B8G8A8B8G8"
1030 DATA "A2A8P8>D8.<B16GGGE8D8G8AF#8"
1040 DATA "GF#8F8EG#8B8EBA2A8P8D8D8"
1050 DATA "G.F#8GBA.G#8AF#8D8E8GE8"
1060 DATA "GF#G2D8P8"
2000 DATA "V12T12001MBL8A4GP8>C4<GP8D4<GP8>D<BGP8>D4"
2010 DATA "<GP8>D4<GP8G#4>D016E16D<A>D<D>D0D4E4"
2020 DATA "F#DEF#<G4F#4EP8E>E<AP8>EP8<AP8>EE--"
2030 DATA "DE4FF#P8D4<GP8>C4<G>P8D4<GP8>DP8"
2040 DATA "<GP8>D4<G#4>E4<B4>E4<A>E16F16EC<AP8D"
2050 DATA "G4.F#G4B4A4.G#A4>D4<GA4A"
2060 DATA ">EE-D<DG>D16C#16DEGP8"
3000 DATA "V12T12002MBL8D.B16D4D4<B4AGB4BP8B>CC"
3010 DATA "P8<B>CCP8<BBB>C2.CCP8CP8C"
3020 DATA "P8CCCP8<BP8>D#P8E4<B>GG4CGG4C"
3030 DATA "F#C4CCP8F#4P8<BP8>EP8<B>CC<BB4B"
3040 DATA "P8BBBP8BB>DP8<G#P8>DC2CP8F#4"
3050 DATA "P8<B16B16BP4BP8>GP8F#16F#16DP8P8DCCC#C4C#"
3060 DATA "C4C4<BD16C#16DEBP8"
```

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TIPS TO THE TYPIST

SOME GENERAL RULES

1. Read instructions and program headings carefully.
2. Don't let fatigue and boredom contribute to inaccuracy. If you're new to programming, type in a longer program in easy stages, saving each installment as you go.
3. Assume that every character in a program listing must be copied accurately if a program is to work.
4. Watch out for potential trouble spots. About 90 percent of all typing errors occur in DATA statements.
5. Be aware that our program listings are printed 54 characters wide. Thus, a single BASIC program "line" (sometimes called a "logical line") may appear as several lines in our listing. If you are typing along and reach the right margin of the printed listing, don't press RETURN or ENTER before checking to see if the program "line" you're typing really ends there.
6. To correct an error in a BASIC program line, type the line in again from the beginning, and press RETURN or ENTER to replace the old line.

DEBUGGING HINTS

1. Write down any error messages you receive.
2. Look up error messages in your manual, and check the indicated lines for simple mistakes. Also check related lines, such as the DATA statements corresponding to a READ routine. Correct all the problems you can find, and save a corrected copy of the program before typing RUN again.
3. LIST the program in screen-size chunks (check your manual for instructions on how to LIST parts of a program) or get a printout. Compare what you've typed in—letter by letter—to the published program. Make sure that you haven't dropped or mixed up some punctuation, switched uppercase text for lowercase, or vice versa, or miscounted the characters (and/or spaces) between a pair of quotes.
4. Mistakes in DATA statements are the single most common cause of program failures. If you can't find your error in the lines the computer specifies, check your DATA statements line by line, letter by letter, comma by comma.
5. If all else fails, turn off your computer and relax. Then try again the next day—exhausted proofreaders are careless proofreaders.

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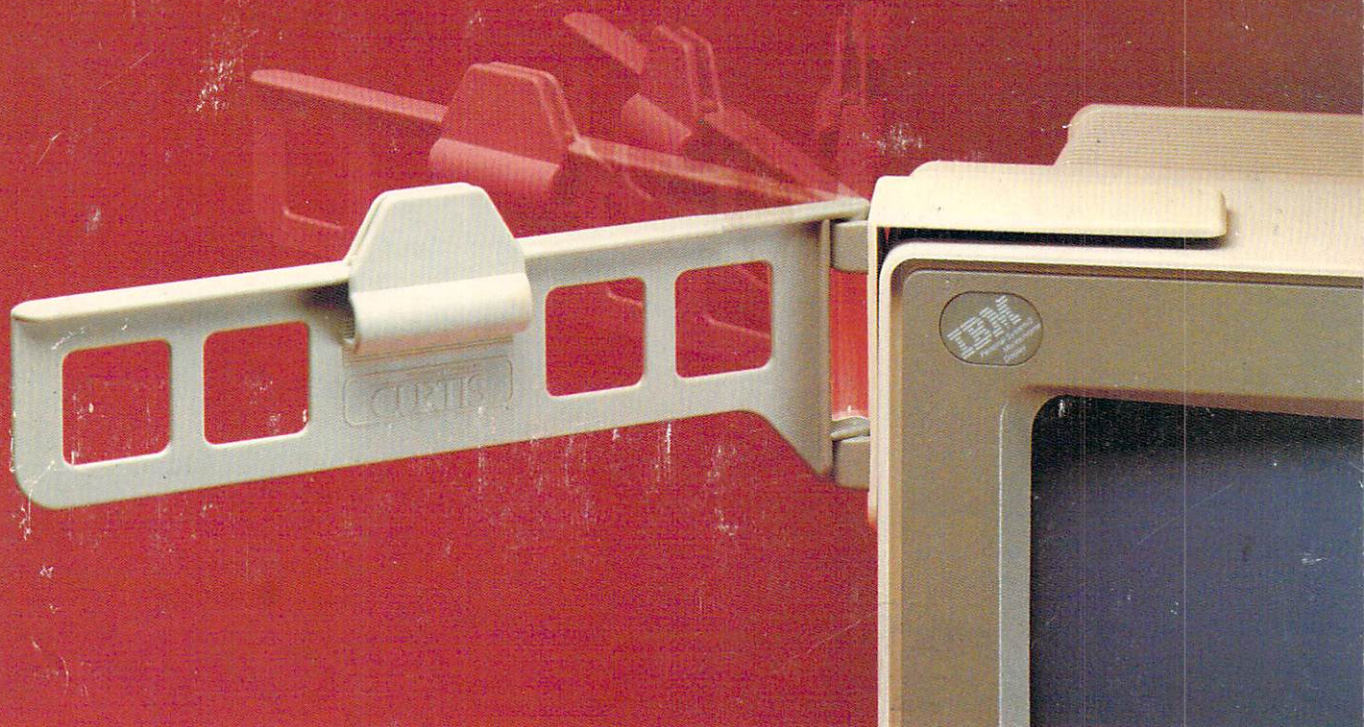
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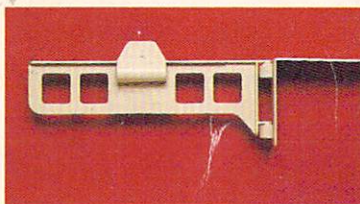
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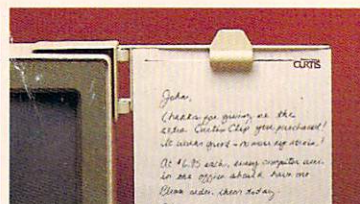
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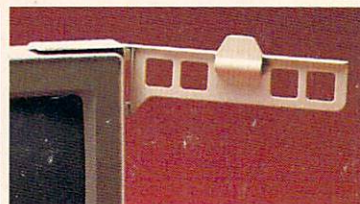
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